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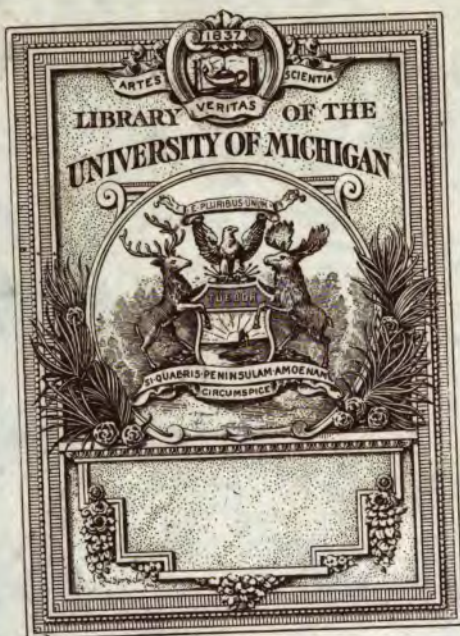
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KANSAS

HORTICULTURAL REPORT

FOR THE YEAR 1886.

CONTAINING THE

**PROCEEDINGS OF THE STATE HORTICULTURAL SOCIETY AT ITS SIXTEENTH SEMI-ANNUAL MEETING, HELD AT WICHITA, SEDGWICK COUNTY, JUNE 29 AND 30,
AND THE TWENTIETH ANNUAL MEETING, HELD AT EMPORIA,
LYON COUNTY, DECEMBER 7, 8 AND 9, 1886.**

EDITED BY THE SECRETARY.

VOL. XVI.

PUBLISHED BY THE STATE.



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KANSAS PUBLISHING HOUSE: T. D. THACHER, STATE PRINTER.

1887.

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FRUIT DISTRICTS.

No. 1—NORTHERN DISTRICT.

(Embraces the following counties.)

ATCHISON,
BROWN,
CHEYENNE,
CLAY,
CLOUD,
DAVIS,
DECATUR,
DICKINSON,
DONIPHAN,
ELLIS,
ELLSWORTH,

GOVE,
GRAHAM,
JACKSON,
JEFFERSON,
JEWELL,
LEAVENWORTH,
LINCOLN,
MARSHALL,
MITCHELL,
NEMAHA,
NORTON,

OSBORNE,
OTTAWA,
PHILLIPS,
POTTAWATOMIE,
RAWLINS,
REPUBLIC,
RILEY,
ROOKS,
RUSSELL,
SALINE,

SHAWNEE,
SHERIDAN,
SHERMAN,
SMITH,
ST. JOHN,
THOMAS,
TREGO,
WALLACE,
WASHINGTON,
WYANDOTTE.

No. 2—CENTRAL DISTRICT.

(Embraces the following counties)

ANDERSON,
BARTON,
CHASE,
COFFEY,
DOUGLAS,
EDWARDS,
SEQUOYAH (North half),
FRANKLIN,
GRAY,

GREELEY,
HAMILTON
(North of Arkans. river),
HARVEY,
HODGEMAN
(North of Arkans. river),
JOHNSON,
KEARNEY
(North of Arkans. river),

LANE,
LINN,
LYON,
MARION,
McPHERSON,
MIAMI,
MORRIS,
NESS,
OSAGE,

PAWNEE,
RENO,
RICE,
RUSH,
SCOTT,
STAFFORD,
WABAUNSEE,
WICHITA.

No. 3—SOUTHERN DISTRICT.

(Embraces the following counties.)

ALLEN,
ARAPAHOE,
BARBER,
BOURBON,
BUTLER,
CHAUTAUQUA,
CHEROKEE,
CLARK,
COMANCHE,
COWLEY,

CRAWFORD,
EDWARDS,
ELK,
FORD,
GRANT,
GREENWOOD,
HAMILTON
(South of Arkans. river),
HARPER,

KANSAS,
KEARNEY
(South of Arkans. river),
KINGMAN,
KIOWA,
LABETTE,
MEADE,
MONTGOMERY,
NORTON,

NEOSHO,
PRATT,
SEDGWICK,
SEWARD,
STANTON,
STEVENS,
SUMNER,
WILSON,
WOODSON.

OFFICERS AND STANDING COMMITTEES FOR 1887.

OFFICERS.

President.

GEO. Y. JOHNSON, LAWRENCE, DOUGLAS COUNTY.

Vice President.

MARTIN ALLEN, HAYS CITY, ELLIS COUNTY.

Secretary.

G. C. BRACKETT, LAWRENCE, DOUGLAS COUNTY.

Treasurer.

F. WELLHOUSE, FAIRMOUNT, LEAVENWORTH COUNTY.

Trustees.

NORTHERN DISTRICT, DR. CHAS. WILLIAMSON, Washington, Washington County.

CENTRAL " E. P. DIEHL, Olathe, Johnson County.

SOUTHERN " L. A. SIMMONS, Wellington, Sumner County.

STANDING COMMITTEES.

Nomenclature, and New Fruits :

G. C. BRACKETT, Lawrence.

A. ALLEN, Wabaunsee.

F. WELLHOUSE, Fairmount.

Botany and Vegetable Physiology :

WM. A. KELLERMAN, Ph. D., Agr. College, Man.

WM. CUTTER, Junction City.

Entomology :

A. N. GODFREY, Madison.

WARREN KNAUS, Salina.

Orchard Culture :

NORTHERN DISTRICT, F. WELLHOUSE, Fairmount.

CENTRAL " GEO. OLIVANT, Conway.

SOUTHERN " J. W. ROBINSON, Towanda.

Forestry :

NORTHERN DISTRICT, M. ALLEN, Hays City.

SOUTHERN " J. B. SCHLICHTER, Sterling.

" " J. F. MARTIN, Winfield.

Small Fruits :

JUDSON WILLIAMS, Ottawa.

B. F. SMITH, Lawrence.

F. HOLSINGER, Rosedale.

Floriculture :

ROBT. MILLIKEN, Emporia.

MRS. CHAS. WILLIAMSON, Washington.

Vegetable Gardening :

NORTHERN DISTRICT, E. J. HOLMAN, Leavenworth.

CENTRAL " H. MANWARING, Lawrence.

SOUTHERN " JUDSON WILLIAMS, Ottawa.

Handling Fruits :

D. G. WATT, Lawrence.

E. P. DIEHL, Olathe.

Meteorology :

PROF. F. HAWN, Leavenworth.

PROF. JOHN H. WOLFE, Wellington.

PROF. J. T. LOVEWELL, Topeka.

Vine Culture :

JACOB WEIDMAN, Pleasant Valley.

G. F. ESPENLAUB, Rosedale.

JUDGE L. HOUK, Hutchinson.

Landscape Gardening :

JUDGE L. HOUK, Hutchinson.

Horticulture Connected with Farming :

SAMUEL REYNOLDS, Lawrence.

J. F. MARTIN, Winfield.

Geology and Soils :

L. A. SIMMONS, Wellington.

Ornithology :

PROF. F. H. SNOW, State University.

DAVID E. LANTZ, M. Sc., Agr. College, Manhattan.

Needed Legislation :

HON. CHAS. WILLIAMSON, Washington.

HON. R. E. LAWRENCE, Wichita.

E. P. DIEHL, Olathe.

Experimental Horticulture :

EDWIN A. POPENOE, A. M., Agr. College, Man.

LIST OF MEMBERS.

HONORARY MEMBERS.

(Enrolled in the order conferred.)

DR. L. D. MORSE,	St. Louis, Mo.	PRESIDENT'S OFFICE, Kansas Agri- cultural College,	Manhattan.
N. J. COLMAN, Commis- sioner Dept. Agriculture. }	Washington, D. C.	CHAIR OF CHEMISTRY AND MINER- ALOGY, Agricultural College, . . . }	Manhattan.
C. W. MURTFELDT,	St. Louis, Mo.	CHAIR OF HORTICULTURE AND ENTO- MOLOGY, Agricultural College, . . }	Manhattan.
WILLIAM KING,	St. Louis, Mo.	CHAIR OF BOTANY AND ZOOLOGY, Agricultural College,	Manhattan.
PROF. C. V. RILEY,	Washington, D. C.	PROF. D. E. LANTZ, Agr. College, . .	Manhattan.
SAMUEL MILLER,	Bluffton, Mo.		
PROF. S. T. KELSEY,	Highlands, N. C.		
PROF. F. H. SNOW, State Uni- versity,	Lawrence.		

LIFE MEMBERS.

(In the order and year enrolled.)

G. C. BRACKETT,	Lawrence,	1868.	HON. T. C. HENRY,	Denver, Col.,	1880.
C. G. WICKERSHAM,	Parsons,	1876.	GEO. T. FAIRCHILD, Pres- ident Agricultural College, }	Manhattan,	1880.
DR. J. M. DEBALL,	Fontana,	1876.	CHARLES A. DOW,	Hartford,	1881.
PROF. E. GALE,	Lake Worth, Fla.,	1876.	J. V. RANDOLPH,	Emporia,	1881.
H. E. VAN DEMAN,	Geneva,	1876.	JOHN CLOUGHERLY,	Parsons,	1882.
SECRETARY'S OFFICE, MANHATTAN HORTICULTURAL SOCIETY,		1876.	JOHN S. HICKS,	Roslyn, N. Y.,	1882.
FRED. WELLHOUSE,	Fairmount,	1877.	E. P. HARRIS,	Lecompton,	1882.
ABNER ALLEN,	Wabaussee,	1877.	ED. BILLINGS,	Prescott,	1883.
SECRETARY'S OFFICE, JOHNSON COUNTY HORTICULTURAL SOCIETY,		1877.	B. WOODWARD, M. D.,	Olathe,	1884.
GEO. Y. JOHNSON,	Lawrence,	1878.	PROF. E. A. POPENOE, Agri- cultural College,	Manhattan,	1884.
ROBERT MILLIKEN,	Emporia,	1878.	C. H. LONGSTRETH,	Lakin,	1884.
A. A. ADAMS,	Garnett,	1878.	A. C. GRIESA,	Lawrence,	1885.
W. E. FOSNOT,	Hutchinson,	1878.	H. MANWARING,	Lawrence,	1885.
DR. J. STAYMAN,	Leavenworth,	1879.	S. W. MILES,	Clay Center,	1885.
A. N. GODFREY,	Madison,	1879.	L. A. SIMMONS,	Wellington,	1885.
J. A. MOSHER,	Scandia,	1879.	M. R. MOSHER,	Wichita,	1886.
E. P. DIEHL,	Olathe,	1880.	HON. R. E. LAWRENCE,	Wichita,	1886.
JAMES MARVIN, D. D.,	Lawrence,	1880.	J. A. CLEVELAND,	Madison,	1886.

ANNUAL MEMBERSHIP FOR 1887.

LADIES ENROLLED AT THE SEMI-ANNUAL MEETING, 1886.

BALDWIN, MRS. M. R.,	Wichita.	RICE, MRS. E. C.,	Augusta.
COLLINGS, MRS. M. S.,	Wichita.	SIMMONS, MRS. L. A.,	Wellington.
CURRY, MRS. W. H.,	Gordon.	THOMPSON, MISS CORA,	Wichita.
HOMER, MRS. C.,	Brainard.		

GENTLEMEN ENROLLED AT THE SEMI-ANNUAL MEETING, 1886.

ARMSTRONG, E. E.,	Benton.	RICE, E. C.,	Augusta.
CURRY, W. H.,	Gordon.	ROBISON, J. W.,	Towanda.
FORBES, W. J.,	McPherson.	THOMPSON, E. P.,	Wichita.
PARKER, WILLIAM,	Clearwater.		

ENROLLED AT THE ANNUAL MEETING, DECEMBER 7-9, 1886.

AVERY, J. B.,*	Clifton.	BUTLER, VAN E.,*	Delphos.
ALLEN, M.,*	Hays City.	BAIRD, J. C.,*	Easton.
BUCKMAN, THOMAS,*	Topeka.	BYRAM, E. T.,*	Jewell.

*County Vice President.

ANNUAL MEMBERS FOR 1887—*Continued.*

BROWN, H. L.,*	Invermay.	HIXON, J.,*	Holton.
BYRAM, J. W.,*	Cedar Point.	HARBAUGH, D.,*	Waterville.
BRITTON, H.,*	Radical City.	HARDING, WM.,*	Nevada.
BALDWIN, D. C.,*	Hart's Mills.	HANAN, B. P.,*	Arlington.
BROWN, GEO. B.,*	Fredonia.	HORNER, I.,	Emporia.
BESTER, F. W.,*	Pawnee Rock.	HAYDEN, C. W.,*	Thayer.
BEAVER, JOHN.,*	Ottumwa.	HATFIELD, C. M.,*	Bates.
BARNES, E. F.,*	Marion.	HART, H. B.,*	Fort Scott.
BOGGS, THEO.,*	McPherson.	JENNINGS, T. B.,	Lebo.
BISHOP, L.,*	Oswatomic.	JEWETT, A. W.,*	DeSoto.
BOYS, ROBT.,*	Whitfield.	JOHNSON, GEO. F.,*	Forrester.
BURROUGHS, C. N.,*	Zurich.	KELLY, D. S.,	Emporia.
BIDWELL, J. W.,*	Wellmanville.	KERN, H. H.,*	Tiblow.
BOOTH, H.,*	Garfield.	KRITCHFIELD, W. B.,*	Wakeeney.
BOYLE, J. F.,	Nathan.	KNODLE, J. W.,*	Dickeyville.
CALDWELL, D.,*	Wilburn.	KEELER, A. R.,*	Clay Center.
CORBETT, J. B.,*	Bunker Hill.	KELSEY, C. C.,*	Humboldt.
CHASE, R. C.,*	Hiawatha.	KEAR, C.,*	Council Grove.
COOK, THOS.,*	Monrovia.	KERN, C. E.,†	Rosedale.
COOK, A. J.,*	Wichita.	LIPP, H. W.,*	Rossville.
CROSS, JOHN A.,*	Chanute.	LEACH, JOS.,*	Havensville.
COLTON, L. J.,*	Girard.	LITSON, WM. H.,*	Benton.
CARSON, LEONIDAS,*	Anthony.	LEWIS, S. D.,*	Elk Falls.
CRANDALL, R. W.,*	Newton.	LEACH, L. W.,*	Kingman.
CLARK, J. G.,*	Waveland.	LATIMER, J. W.,*	Pleasanton.
CABLE, FEALDEN,†	Brookville.	LOVEJOY, C. H.,*	Baldwin City.
CONE, LYMAN,†	Burrton.	LATHROP, G. A.,*	Lenora.
COLVIN, W. J.,*	Larned.	LYNN, JAS. A.,*	Meade Center.
CRAIG, THOS.,	Americus.	MOXLEY, CHAS.,	Madison.
CHAMBERS, A. D.,	Hartford.	McKEE, JOHN,†	Reedsville.
CAMPBELL, W. E.,*	New Kiowa.	McNEIL, C. G.,*	Stafford.
CROSSMAN, R. A.,*	Coldwater.	MEARS, W. H.,*	Peabody.
COLLAR, M.,*	Dodge City.	MEASER, J. J.,*	Hutchinson.
DUNLOP, JAS.,*	Detroit.	MULLANEY, J. H.,*	Wild Horse.
DOYLE, JAS. H.,	Emporia.	MOHLER, M.,*	Downs.
DOBBS, J. B.,*	Antelope.	McGEE, S.,*	Delhi.
DUBOIS, H.,*	Burlingame.	MIKESELL, W. A.,*	Atwood.
DAWSON, M. H.,†	Peabody.	McCULLOUGH, S.,†	Delevan.
DONALD, CHAS.,*	Wano.	MORRISON, D.,*	Greensburg.
EBERLE, HENRY,†	Arthur.	NIXON, J.,*	Kellogg.
FULLER, JR., JOHN,†	Seneca.	NICKERSON, N.,*	Sandago.
FULKERSON, F. B.,*	Barnard.	NICOLL, JAS.,*	Spearsville.
FREEMAN, D. S.,*	Columbus.	OLIVANT, GEO.,*	Conway.
GOODNOW,† ISAAC,	Manhattan.	O'TOOLE, JOHN,†	Devizes.
GRISWOLD, D. G.,†	Burlingame.	PORTER, A. B.,*	Schoharie.
GOODWIN, W. M.,†	La Crosse.	PECK, F. B.,*	Princeton.
GODDARD, WILL.,*	Minneapolis.	PURDY, C. T.,*	Purdyville.
GILLETTE, FRANK,†	Saratoga.	PANCOAST, B. F.,*	Iola.
GUNN, LEVI,†	Great Bend.	ROBISON, J. W.,	Towanda.
GATES, JAS. H.,*	Syracuse.	ROSENBERGER, E. L.,*	Sabetha.
HASTING, J. S.,	Emporia.	ROBERTS, H. R.,*	Perry.
HILL, C. F.,	Emporia.	ROBSON, PROF. J. W.,*	Cheever.
HOTZE, R. L.,*	Richland.	REID, JOHN M.,*	Morrill.
HEBREW, S. A.,*	Rockport.	ROSS, W. J.,*	Pretty Prairie.
HOLSINGER, F.,*	Rosedale.	ROUTLEDGE, JOHN,†	Council Grove.
HOBSON, J. C.,*	Winsor.	RIDER, D. W.,†	Parkerville.
HAMMON, C. B.,*	Concordia.	REYNOLDS, W. W.,*	Lakeside.
HOLMAN, E. J.,*	Leavenworth.	STARK, —,	Louisiana, Mo. *
HATCH, S.,*	Wathena.	SPIERS, ALEX.,*	Linn.
HALL, M.,*	Newton.	SOUTHWICK, A.,	Riley Center.
HART, C. P.,*	Rush Center.	SHORT, W. G.,*	Pottersville.
HARRIS, F. B.,*	White City.	SHEFFIELD, C. H.,*	Delphos.
HUBSH, J. F.,†	Garfield.	SNYDER, E.,*	Oskaloosa.

*County Vice President. †Delegate.

ANNUAL MEMBERS FOR 1887 — *Concluded.*

SWEHLA, F. J.*	Wilson.	TAYLOR, P. S.*	Eskridge.
SCHLICHTER, J. B.*	Sterling.	TRASK, D. F.*	Cimarron.
SMITH, W. W.*	Leroy.	TAYLOR, J. HIRAM*	Pearl.
SMITH, T. W.*	Baxter Springs.	VOORHEES, P.*	Lawrence.
SIMPSON, JAS.*	Emporia.	WILLIAMSON, MRS. CHAS.*	Washington.
SMITH, VAN.*	Hackberry.	WOLVERTON, E. H.*	Barnes.
STARE, C. M.*	Ulysses.	WELLS, T. C.*	Manhattan.
SMITH, M. C.*	Yates Center.	WETMORE, GEO. A.*	Oneida.
SMITH, B. F.†	Lawrence.	WIDMAN, J.*	Pleasant Valley.
SHARPE, JAS.†	Parkerville.	WHEELER, JOSHUA,*	Nortonville.
SMITH, A. M.†	Hutchinson.	WILLIAMS, J. W.*	Cope.
SAMPSON, J. G.†	Derby.	WARD, H. J.*	Farmington.
TAYLOR, L. R.*	Topeka.	WILLIAMS, J. L.*	Oswego.
TAYLOR, E. A.*	Beloit.	WHITE, J. E.*	Kent.
TRAFTON, N.*	Milford.	WILLIAMS, JUDSON,*	Ottawa.
TANNER, O. R.*	Barry.	WIMER, J. B.*	Emerson.
TAYLOR, JOSHUA.*	Richmond.	WILLIS, A.†	Ottawa.
TAYLOR, EDWIN.†	Wyandotte.		

* County Vice President. † Delegate.

LIST OF HORTICULTURAL SOCIETIES FOR 1887.

SOCIETY.	SECRETARY.	P. O. ADDRESS.
FALL RIVER DISTRICT HORTICULTURAL ASSOCIATION, . . .	Abner Howard,	Fall River.
NORTHWESTERN HORTICULTURAL SOCIETY, . . .	E. A. Taylor,	Beloit.
ALLEN COUNTY " " " "	B. F. Pancost,	Iola.
ANDERSON COUNTY " " " "	M. A. Page,	Garnett.
ATCHISON COUNTY " " " "	Thos. F. Cook,	Monrovia.
BAVARIA " " " "	A. K. Mott,	Bavaria.
BROWN COUNTY " " " "	Jos. Henney,	Hiawatha.
BUTLER COUNTY " " " "	Dr. Wm. Snyder,	Towanda.
CLOUD COUNTY " " " "	C. B. Hammond,	Concordia.
COMANCHE COUNTY " " " "	R. A. Crossman,	Coldwater.
COWLEY COUNTY " " " "	J. Nixon,	Winfield.
CRAWFORD COUNTY " " " "	L. J. Colton,	Girard.
DAVIS COUNTY " " " "	John Davis,	Junction City.
DICKINSON COUNTY " " " "	J. W. Robson,	Cheever.
NORTH DICKINSON " " " "	C. H. Colman,	Cheever.
DONIPHAN COUNTY " " " "	S. Hatch,	Wathena.
DOUGLAS COUNTY " " " "	B. F. Smith,	Lawrence.
DOYLE VALLEY " " " "	M. H. Dawson,	Peabody.
ELK COUNTY " " " "	D. C. Harkness,	Howard.
FRANKLIN COUNTY " " " "	J. Williams,	Ottawa.
HARVEY COUNTY " " " "	H. A. Ensign,	Newton.
HODGEMAN COUNTY " " " "	H. F. Mack,	Jetmore.
JACKSON COUNTY " " " "	Chas. G. Townsend,	Holton.
KANSAS CENTRAL " " " "	H. Day,	Lyons.
LANARK TOWNSHIP " " " "	Thos. Murry,	Stockton.
LYON COUNTY " " " "	Jas. Simpson,	Emporia.
LEAVENWORTH COUNTY " " " "	Miss A. Bowman,	Leavenworth.
LABETTE COUNTY " " " "	John F. Hill,	Oswego.
MANHATTAN " " " "	W. J. Griffing,	Manhattan.
MADE COUNTY " " " "	Jas. A. Lynn,	Meade Center.
MIAMI COUNTY " " " "	E. W. Robinson,	Paola.
MISSION CREEK " " " "	P. S. Taylor,	Eckridge.
MONTGOMERY COUNTY " " " "	W. T. Yoe,	Independence.
MORRIS COUNTY " " " "	F. B. Harris,	White City.
OSAGE COUNTY " " " "	H. Dubols,	Burlingame.
OSBORNE COUNTY " " " "	W. G. Short,	Pottersville.
PAWNEE COUNTY " " " "	C. C. Chevalier,	Garfield.
RENO COUNTY " " " "	S. F. Taft,	Hutchinson.
REPUBLIC COUNTY " " " "	O. A. A. Gardner,	Belleville.
RICE COUNTY " " " "	J. H. Stubbs,	Sterling.
RUSH COUNTY " " " "	Wm. Newman,	La Crosse.
SALINE COUNTY " " " "	J. A. Banker,	Salina.
SEDGWICK COUNTY " " " "	D. A. Mitchell,	Wichita.
SOUTHERN KANSAS " " " "	P. C. Bowen,	Cherry Vale.
SOLOMON VALLEY " " " "	Van E. Butler,	Delphos.
SUMNER COUNTY " " " "	L. A. Simmons,	Wellington.
WABAUNSEE COUNTY " " " "	H. A. Stiles,	Pavilion.
WASHINGTON COUNTY " " " "	Alex. Splers,	Linn.
WILSON COUNTY " " " "	G. B. Brown,	Guilford.
WAVELAND " " " "	John Deltrick,	Carbondale.

CERTIFICATE OF INCORPORATION.

We, the undersigned citizens of Kansas, do hereby associate ourselves as a body corporate, to be known as the KANSAS STATE HORTICULTURAL SOCIETY, for the promotion of horticultural and pomological science in the State of Kansas.

The principal office or place of business of said Society shall be at the city of Lawrence, or such other place in the State of Kansas as the Society may designate at a regular meeting thereof.

The number of Trustees of said Society shall be seven, and such Trustees shall have power to make all necessary rules and by-laws for the government of said Society and the transaction of its business.

Said Society shall have succession, under the provisions of this charter and the laws of the State of Kansas, for the term of nine hundred and ninety-nine years.

In witness of all which, we have hereunto set our hands and seals, at the city of Ottawa, in the county of Franklin, in said State of Kansas, this fifteenth day of December, A. D. 1869.

WM. TANNER, *Leavenworth.*

C. B. LINES, *Wabaunsee.*

WM. M. HOWSLEY, *Leavenworth.*

S. T. KELSEY, *Pomona.*

G. C. BRACKETT, *Lawrence.*

GEO. T. ANTHONY, *Leavenworth.*

J. STAYMAN, *Leavenworth.*

STATE OF KANSAS, }
COUNTY OF DOUGLAS, } ss.

On this 15th day of December, 1869, before me, a notary public in and for said county, came William Tanner of Leavenworth county, Charles B. Lines of Wabaunsee county, William M. Howsley of Leavenworth county, S. T. Kelsey of Franklin county, George C. Brackett of Douglas county, George T. Anthony of Leavenworth county, J. Stayman of Leavenworth, to me personally known to be the identical persons described in and who signed the above charter, and acknowledged the same to be their own act and deed for the purposes therein.

[SEAL.]

JAMES CHRISTIAN,
Notary Public, Douglas County.

I, W. H. Smallwood, Secretary of the State of Kansas, do hereby certify that the foregoing is a true and correct copy of the original certificate of incorporation, filed in my office December 20, A. D. 1869.

In testimony whereof, I have hereunto subscribed my name and affixed the great
{ GREAT SEAL } seal of the State. Done at Topeka, this twenty-ninth day
{ OF KANSAS. } of August, A. D. 1871.

W. H. SMALLWOOD, *Secretary of State.*

CONSTITUTION.

ARTICLE I. This association shall be known as the KANSAS STATE HORTICULTURAL SOCIETY.

ART. II. Its object shall be the advancement of the science and art of horticulture.

ART. III. Its membership shall consist of annual members, paying an annual fee of one dollar; of life members, paying a fee of ten dollars at one time;* and of honorary members, who shall be persons only of distinguished merit in horticulture, and shall be elected to membership by a vote of the Society.

ART. IV. Its officers shall consist of a President, Vice President, Secretary, and Treasurer, who shall be elected by ballot at each annual meeting of the Society, and shall hold their office for the term of one year, or until their successors shall be elected. They shall perform the duties usually devolving upon such officers, and shall be *ex officio* members of the Board of Trustees, consisting of the above-named officers and three other members, who shall be elected and hold their term of office as the other officers. Said Board shall, under the direction of the Society, manage all its affairs.

ART. V. It shall hold an annual meeting in the month of December, and a semi-annual meeting in the month of June, at such time and place as the Society or Board of Trustees may direct.

ART. VI. This constitution may be amended at any annual meeting of the Society by a two-thirds vote of the members present.

[Additional article, adopted at the Seventh Annual Meeting, December 2, 1873.]

ART. VII. There shall be a Vice President annually appointed from each county in the State, whose duty it shall be to organize local horticultural societies in their respective counties, whenever practicable; to report at each annual meeting on the general subject of fruit-culture in their respective counties; and to look after the general interests of horticulture in their particular localities.

[Additional article, adopted at the Sixteenth Annual Meeting, December 5, 1882.]

ART. VIII.—SECTION 1. The legislative body of the Society shall consist only of life members, Vice Presidents of each county, and two delegates from each district and county horticultural society which shall have complied with the requirements of Amendment 2 of Article III, adopted at the Ninth Annual Meeting, held December 15, 1875.

SEC. 2. That all provisions heretofore adopted as amendments to or otherwise affecting the Constitution, conflicting with these amendments and Article VIII, be and the same are hereby repealed.

[Additional article, adopted at the Seventeenth Annual Meeting, December 5, 1883.]

ART. IX. The Secretary or Treasurer of the Society shall have power to appoint a deputy for their respective offices, who may, under the instructions of the principal and in his name, perform any and all the duties pertaining to said office.

[Additional article, adopted unanimously, at the Nineteenth Annual Meeting, December 1, 1885.]

ART. X.—SECTION 1. It shall be the duty of the members of this Society at all times to exert their influence to protect its interests, and promote the objects for which it was organized.

SEC. 2. If any member shall at any time or place, by words or actions, willfully seek to injure this Society or any of its members, or manifest an inimical spirit to-

*See amendment No. 3, Sec. 1.

ward it, or be guilty of any grossly improper conduct, said member shall be deemed guilty of a violation of section 1 of this article, and on conviction thereof shall be reprimanded, suspended, or expelled.

Sec. 3. For any of the offenses specified in the foregoing section, charges in writing shall be preferred by any member or officer cognizant of the offense, against the offending person, which must be filed in the Secretary's office; and said person accused shall be tried under the charges by the Board of Trustees—notice of the day and place of trial being given the accused, together with a copy of the charges, at least ten days prior to trial. It shall be the duty of the Board of Trustees, within ten days after the closing of the trial, to give the accused, through the Secretary of the Society, a written notification of the judgment in the case, and, if convicted, the grade of punishment attaching to the judgment.

Sec. 4. Any person tried and convicted of an offense may, within ten days from the day notice was given him of such judgment, appeal to the Society by filing with the Secretary a written notice of such appeal, and a concise statement of the point or points on which the appeal is taken, or be barred from any further action—the judgment of the Board becoming final. Such appeal shall be tried before the legislative body of the Society at its next regular meeting, but only upon a transcript of the evidence introduced during the trial before the Board. The judgment of the Society shall be final.

Sec. 5. A conviction under the foregoing sections shall not debar any person from the rights and privileges of membership for a longer period than three years, excepting in cases of expulsion and continued disloyalty—in which case it shall be perpetual. Disabilities may be removed at any subsequent regular meeting by a two-thirds vote of the legislative body of the Society, on the grounds of good behavior, and pledges of strict loyalty thereafter.

AMENDMENTS.

[No. 1.—At the Fifth Annual Meeting, December 19, 1871, Article III was amended as follows:]

Resolved, That Article III of the Constitution be so amended that all annual memberships shall expire on the morning of the second day of the next annual meeting, and all semi-annual memberships shall expire on the morning of the second day of the next semi-annual meeting.

[No. 2.—At the Ninth Annual Meeting, December 15, 1875, Article III was amended as follows:]

Ladies attending the meetings of the Society may become members without fee; and two delegates from each of the district horticultural societies, and one delegate from other auxiliary horticultural societies organized under the general statutes of the State of Kansas, attending the meetings of the Society, shall be entitled to a membership without payment of the usual fee.

[No. 3.—At the Tenth Annual Meeting, December 5, 1876, Article III was amended as follows:]

SECTION 1. Of life members paying a fee of ten dollars in four annual installments of two dollars and a half each.

Sec. 2. That the office of secretary of any district, county and local horticultural society may be made a perpetual membership, upon the terms provided for a life-membership.

[No. 4.—At the Thirteenth Annual Meeting, December 16, 1879, Article III was amended as follows:]

That any person who shall have performed the duties of a County Vice President under the provisions of Article VII of the Constitution for one year, shall be enrolled an annual member; and that when such services shall have been rendered for the term of ten years, consecutive or otherwise, such person shall be enrolled as a life member, and entitled to all the benefits of such membership.

[No. 5.—At the Sixteenth Annual Meeting, December 5, 1882, Article III was amended as follows:]

Any of the aforesaid memberships may be, *for cause*, conferred by a vote of the Board at any of its called meetings, subject to confirmation by the Society at the following annual meeting.

[No. 6.—At the Sixteenth Annual Meeting, Article IV was amended as follows:]

Its officers shall consist of a President, Vice President, Secretary, and Treasurer, who shall be elected by ballot at the annual meetings, and hold their term of office for two years, dating from the first day of July next following the annual meeting at which they were elected. They shall perform the duties usually devolving upon such officers, and shall be *ex officio* members of the Board of Trustees, consisting of the above-named officers and three other members, who shall be elected by ballot at an annual meeting, and hold a term of office for three years from the date of election thereafter. The present Trustees shall hold their term of office as follows: The first Trustee for a term of one year, the second for a term of two years, and the third for a term of three years, from the date of election; and hereafter, at each annual meeting, there shall be elected one member of said Board of Trustees, to fill the office of the outgoing member. All the officers shall hold their respective offices until a successor is elected.

[No. 7.—At the Seventeenth Annual Meeting, December 5, 1883, Article IV was amended as follows:]

The Board of Trustees shall have power to fill any vacancy occurring in the offices provided for in Article IV of the Constitution, between the annual meetings of the Society; and any officer so appointed shall hold his respective office until the next succeeding annual meeting, or until a successor shall be elected by the Society.

STATE LAWS RELATING TO HORTICULTURE.

COMMISSIONER OF FORESTRY.

[CHAPTER —, SESSION LAWS 1887.]

AN ACT to establish the office of Commissioner of Forestry, prescribing the power and duties thereof, and to encourage the planting and growing of forest trees in the State of Kansas, and making appropriation therefor.

Be it enacted by the Legislature of the State of Kansas:

SECTION 1. Within twenty days after the taking effect of this act, the Governor shall appoint some person who has a practical knowledge of growing forest trees, who shall be known as the Commissioner of Forestry of the State of Kansas, who shall hold his office for the term of two years.

SEC. 2. It shall be the duty of the Commissioner of Forestry, provided for in this act, to procure donation of two suitable tracts of land of not less than one hundred and sixty acres each, at points not to exceed three miles from a station on the Union Pacific Railway, Kansas division, and on the Atchison, Topeka & Santa Fé Railroad, respectively. These tracts shall be donated to the State of Kansas, for the purposes named in this act, to be and remain the property of the State, in the event of the continuation of these forestry stations by the State, for the period of ten years from the date of their establishment; otherwise the title of said tract or tracts to revert to the donor or donors. The Commissioner of Forestry shall establish an experimental forest station upon each of said tracts of land, the object of which shall be the promotion of the art of forestry, and where he shall plant seeds and cuttings of various kinds of forest trees, especially such as are likely to thrive in that portion of Kansas known as the Plains, the seedlings or trees growing from which he shall issue free of charge, at each station, to any resident of the State of Kansas who may apply for the same, in such quantities and under such restrictions as may in the judgment of said Commissioner be advisable.

SEC. 3. The Commissioner of Forestry, by himself or suitable employé, shall give such information as may be in his possession, by letter, circular, or otherwise, upon the subject of forest trees, and shall give all persons visiting these experimental stations the benefit of his experience and that of his predecessors.

SEC. 4. Said Commissioner of Forestry shall annually make a report to the Governor, giving a detailed account of his proceedings under this act, embodying a full statement of all expenditures in his office, including purchase of all the stock, trees, seeds, plants, and cuttings, as well as expenditures for labor, help, printing, traveling, and any other expenses properly appertaining to his office. He shall also embody in such report a detailed account of his experiments in tree-growing, noting the failures as well as the cause of success, to the end that reliable information may be disseminated. He may also make such recommendations as may be suggested by his experience.

SEC. 5. It shall be the duty of the Commissioner of Forestry, when requested by petition of twenty-five persons in any county in the State, to go into such county and hold one or more meetings therein for the dissemination of knowledge upon the subject of forestry: *Provided, however,* That such meetings shall be no expense to the State.

SEC. 6. Before entering upon the duties of his office, the Commissioner of Forestry shall take and subscribe the usual oath of office and enter into bond to the State of Kansas, to be approved by the Executive Council, in the sum of \$5,000, for the faithful performance of the duties of his office.

SEC. 7. For the purpose of carrying into effect the provisions of this act, there is hereby appropriated out of any money in the State treasury not otherwise appropriated, for the unexpired fiscal year ending June 30, 1887, for salary of said Commissioner, the sum of \$100 per month; for the purchase of trees, plants, seeds, and cuttings, or so much thereof as may be necessary, the sum of \$350; for labor, help, freight, postage, and other incidental expenses, the sum of \$1,500. For the fiscal year ending June 30, 1888: For salary of Commissioner, \$1,200; for the purchase of trees, plants, seeds, and cuttings, or so much thereof as may be necessary, the sum of \$1,000; for labor, help, freight, postage, and other incidental expenses, the sum of \$5,000; for traveling expenses of said Commissioner, or so much thereof as may be necessary, the sum of \$300. For the fiscal year ending June 30, 1889: For salary of Commissioner, \$1,200; for the purchase of trees, plants, seeds, and cuttings, or so much thereof as may be necessary, the sum of \$1,000; for labor, help, freight, postage, and all other incidental expenses, the sum of \$5,000; for traveling expenses of said Commissioner, or so much thereof as may be necessary, the sum of \$300.

SEC. 8. All bills and accounts of said Commissioner of Forestry shall be duly verified and approved by the Executive Council, and payable by the State Treasurer upon the warrant of the State Auditor.

SEC. 9. The salary of the Commissioner shall begin on the 1st day of March, A. D. 1887, or as soon thereafter as he shall take and subscribe his oath of office and qualify.

SEC. 10. This act shall take effect and be in force from and after its publication in the official State paper.

Approved March 5, 1887.

PUNISHMENT FOR DECEPTION IN SALE OF FRUIT TREES, &c.

[CHAPTER 100, SESSION LAWS 1886.]

AN ACT to punish misrepresentation and deception in the sale of fruit, shade or ornamental trees vines, shrubs, plants, bulbs, and roots.

Be it enacted by the Legislature of the State of Kansas:

SECTION 1. Any person or persons who shall misrepresent, deceive, or defraud any person or persons in the sale of any fruit, shade or ornamental tree or trees, or any vine, shrub, plant, bulb, or root, by substituting inferior or different varieties, or who shall falsely represent the name, age or class of any such fruit, shade or ornamental tree or trees, or any vine, shrub, plant, bulb, or root, shall be guilty of a misdemeanor, and on conviction be fined not less than ten dollars nor more than two hundred dollars, or by imprisonment in the county jail not less than thirty days nor more than six months, or by both such fine and imprisonment, and shall be liable to the party or parties damaged or injured thereby in treble the amount of all damages sustained, to be recovered in any court having jurisdiction thereof.

SEC. 2. This act shall take effect and be in force from and after its publication in the official State paper.

Approved February 19, 1886.

PROTECTION OF GAME.

[CH. 115, SESSION LAWS 1883.]

AN ACT for protection of birds, and to prohibit hunting upon certain lands without consent of owner; providing at what season game may be shot, and prescribing punishments for the violation of this act, and to repeal chapter 110 of Laws of 1881.

Be it enacted by the Legislature of the State of Kansas:

SECTION 1. It shall be unlawful for any person or persons, at any time excepting as hereinafter provided, to catch, kill, trap, shoot, or ensnare, or to pursue with such intent, any wild bird except the wild goose, duck, hawk (excepting the harrier), crow, blue-jay, snipe, curlew, plover, piper, bittern, heron, crane, and woodpecker.

SEC. 2. [As amended by chapter 110, Laws 1886.] It shall not be unlawful for persons to shoot or take possession of any pinnated grouse, or prairie chicken, between the first day of September and the first day of January. It shall, however, be unlawful to catch, trap or ensnare said birds at any time: *Provided*, It shall not be unlawful for a person to shoot quail on his own premises, between the first day of November and the first day of January of each year.

SEC. 3. [As amended by chapter 110, Laws 1886.] It shall be unlawful for any person or persons, at any time, to shoot, hunt or pursue after any wild bird or game upon the occupied or improved premises of another, or upon any traveled or public road that adjoins such occupied or improved premises, without having first obtained permission or consent of the owner or occupant of such occupied or improved premises.

SEC. 4. [As amended by chapter 110, Laws 1886.] It shall be unlawful for any person, company or corporation, at any time to buy, sell or barter within the State of Kansas any birds not excepted in section 1, or the birds enumerated in section 2 of this act. And the having in possession by any person, company or corporation, of any such birds when the shooting, catching or killing thereof is prohibited, shall be deemed *prima facie* evidence of the violation of this act: *Provided*, Nothing in this act shall be so construed as to prevent any person from purchasing from any person who has legally killed the same, any of the birds mentioned in section 1 of this act, for use as food in his own family or selling the same, by the person having lawfully killed the same, to any person for use in his own family.

SEC. 5. Any person found guilty of violation of any of the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof before a justice of the peace shall be fined in a sum not less than five nor more than twenty-five dollars for each and every offense, and costs, together with attorney's fee of ten dollars, and shall be committed until paid.

SEC. 6. In all prosecutions under this act, the justice before whom the same is brought may appoint some attorney at law for the purpose of managing the prosecution of the cause, and such attorney shall be entitled to a fee of ten dollars in each and every case where conviction is had in which he is appointed, which shall be taxed as costs in the case against defendant: *Provided*, The county shall in no case be held for said attorney's fees.

SEC. 7. That it shall not be necessary to prove on the trial, or to state in the complaint, the true name of the bird caught, killed, shot, trapped, netted, or ensnared, in violation of this act.

SEC. 8. The provisions of this act shall not apply to any person who shall kill or catch any wild bird or birds for the sole purpose of preserving them as specimens for scientific purposes: *Provided*, That in a prosecution for a violation of any of the provisions of this act, it shall not be necessary for the prosecution to prove that the killing or catching of any wild bird was not done for scientific purposes.

SEC. 9. That chapter one hundred and ten of the Session Laws of 1881 is hereby repealed.

SEC. 10. This act shall take effect from and after its publication in the *Topeka Weekly Commonwealth*.

Approved March 7, 1883.

TRESPASSES.

[CHAPTER 113, GENERAL STATUTES 1868.]

AN ACT to prevent certain trespasses.

Be it enacted by the Legislature of the State of Kansas:

SECTION 1. If any person shall cut down, injure or destroy, or carry away any tree placed or growing for use, shade or ornament, or any timber, etc., etc., the party so offending shall pay the party injured treble the value of the thing so injured, etc., with costs, and shall be deemed guilty of a misdemeanor, and shall be subject to a fine not exceeding five hundred dollars.

Approved March 3, 1868.

PROCEEDINGS OF THE SIXTEENTH SEMI-ANNUAL MEETING,

HELD AT
WICHITA, SEDGWICK COUNTY, KANSAS,
TUESDAY AND WEDNESDAY, JUNE 29TH AND 30TH, 1886.

[NOTE.—This Society will not be held responsible for individual opinions which are found in this report.—SECRETARY.]

The Society assembled at the G. A. R. Hall, Tuesday, June 29, and was called to order by the Secretary, who announced the resignation of President E. Gale, and decease of Vice President M. B. Newman, and reported the action of the Executive Board in filling the vacancies, viz.: Hon. Geo. Y. Johnson, of Lawrence, to that of President, and William Cutter, of Junction City, Vice President.

Hon. George Y. Johnson was then introduced to the Society, and, after addressing the meeting in a few appropriate remarks, took the chair.

On motion, the following special committees were appointed:

On Program—Capt. E. P. Diehl, of Olathe; T. D. Fox, Wichita; W. H. Litson, Benton.

On Credentials—J. T. Cox, of Fredonia; J. Nixon, Kellogg; J. L. Williams, Oswego.

On Obituary—L. A. Simmons, of Wellington; Dr. Chas. Williamson, Washington; Maj. Frank Holsinger, Rosedale—who were instructed to report resolutions at the next annual meeting, on the decease of Vice President M. B. Newman, of Wyandotte; Dr. Chas. Reynolds, Junction City; J. D. Manlove, Fort Scott, and others, if any should occur *ad interim*.

On motion of Maj. Holsinger, the President appointed the following members a Committee on Badges of Mourning for deceased members: Frank Holsinger, Hon. E. J. Holman, Wm. Cutter.

On motion of H. C. St. Clair, the following members were appointed a Committee on Resolutions: H. C. St. Clair, Belle Plaine; G. F. Jackson, Fredonia; R. Milliken, Emporia.

SMALL-FRUIT MANUAL.

The committee appointed by the Board, under the instructions of the Society, submitted its report, which, after a brief discussion, was recommitted, with the instructions to revise and condense.

On motion, the meeting adjourned until 2 o'clock P. M.

AFTERNOON SESSION.

TUESDAY, JUNE 29, 1886.

President Johnson took the chair at the hour adjourned to, and called the meeting to order.

The report of the Committee on Credentials was submitted by the chairman, which was accepted, and the committee continued.

DISCUSSION OF THE STRAWBERRY.

This report was announced as next in order, and was participated in by the following gentlemen:

L. A. SIMMONS, Wellington: The land for this fruit should be deeply and thoroughly plowed in the fall, and the subsoil well stirred. It will better retain moisture, which is one of the main requisites to success. The rows should be three and a half feet apart, and the plants one foot in the row. Mulching the rows is another valuable aid in producing uniformly large berries.

D. G. WATT, Lawrence: The secret of successful marketing is largely in the care given to the picking and packing. In picking, all small and over-ripe and injured fruit should be left on the ground, or placed in a separate box for jelly or canning. One or two poor berries will frequently reduce the value of a box one-half. Care must be given to picking by the stem, avoiding contact with the fruit. If the juices break out of the berry it will soon sour and cause speedy rot. The top layer should be a true index of the entire box. The trade will soon learn the reliability of each grower's brand, and not hesitate to buy of such as are carefully and honestly put up.

F. HOLSINGER: There is a point to be carefully guarded in handling a crop. At each picking rigidly enforce the rule among the pickers to pick *every* berry that is ripe, so that none are left to become over-ripe by the time of the next picking.

DISCUSSION OF THE RASPBERRY.

D. G. WATT, Lawrence: I am not satisfied with the red varieties of raspberries. They are never as abundant bearers. Of the black sorts, the Gregg, Hopkins, and Smith, under the same treatment, killed to the ground by the cold winter of 1884-5, while the Souhegan lived through. It is the only variety profitable with me. Its main fault is in the shortness of the period in which it ripens. Two or three pickings exhaust the crop.

HARVEY FENTON, Indianola: I planted three acres of our native sorts, and they proved to be unprofitable. The Tyler, while not a rank grower, is very productive. The Gregg is too rank a grower to be wholly successful.

• MAJ. HOLSINGER, Rosedale: The raspberry is as easily grown as a potato. Set in rows five feet apart and three feet in the row, on well-prepared land. The first year cut back the canes to within six or eight inches of the crown; second year to two or three feet. Would "cut back" even canes which have grown five or six feet long. I prefer the Doolittle for an early-ripening variety. Like the Souhegan, it yields only three pickings. The Tyler is a better berry than the Souhegan. For best profits none equal the Hopkins in its season. The McCormick [synonym, Mammoth Cluster] has lost its former good reputation. The Gregg is the only kind subject to rust. I cultivate after every rainfall with a double shovel, and until the canes begin to tip, and then cease. A plantation properly managed will continue to fruit profitably for eight years, and should yield at the rate of \$150 per acre.

J. W. ROBISON, Towanda: Cold winters are not the cause always of injury to the canes of red raspberries. It is often due to the prevalence of an insect which attacks it, known as the thrip. Some varieties are able to resist injury from them.

WM. McCracken, Sunnysdale: Our native sorts are the most profitable with me.

DR. CHAS. WILLIAMSON, Washington: Locality has its effects on varieties. The Turner is very successful in Washington county; next to this are the Doolittle, McCormick, and Gregg.

E. J. HOLMAN, Leavenworth: The red varieties have borne more abundantly this year than usual. Brandywine is the most profitable and hardy of this class, but poor quality. Turner is valued only for home uses. Cuthbert is becoming very profitable, and Souhegan is the most profitable early sort, and the Hopkins ranks next. The Gregg is failing; succeeds best on elevated lands. Shaffer is a good sort for some purposes. I cannot agree with Mr. Holsinger on distances he recommends. Seven feet between rows is the least in which they can be properly cultivated.

J. L. WILLIAMS, Oswego: The red varieties are not the lazy man's berry. Their innumerable sproutings from every root keep anyone busy cutting them away to maintain a very narrow row of bearing canes, which is necessary with this class. If an acre will not yield more than \$150 annually it does not reach the standard of profit.

J. E. WHITE, Kent: The Turner is a profitable sort at Hutchinson.

S. MAXWELL, Arkansas City: The Lost Rubies is the most profitable red variety in my locality.

L. A. SIMMONS, Wellington: The Turner succeeds with me. Gregg did well in 1885, but was not a success this year.

J. F. MARTIN, Winfield: Six years ago I planted the Cuthbert and Reliance. These killed down each year, and were finally plowed under. I then planted the Turner, and thinned the rows to hills a foot apart. These also killed down during the winter of 1885. I abandoned the hill system, and grew them in the matted row, and this season they bore a large crop of berries. Gregg does not succeed with me. I think they are summer-killed. Have practiced cultivating early in spring and until August each year. A late growth must be avoided.

E. H. FINCH, —, Mo.: Deep planting is often fatal. The land should be deeply prepared in the fall, and cross-harrowed and rolled in spring. Then turn three furrows together into a ridge, as for sweet potatoes. Reduce the ridge by cross-harrowing and rolling, and plant thereon. Keep the plants in a bucket of water while planting, and set them in the ground with a spade, a little deeper than they stood where grown.

On motion, adjourned until 8 o'clock in the evening.

TUESDAY, June 29, 1886.

The meeting came to order at the appointed hour; President Johnson in the chair.

An appropriate and impressive address of welcome was delivered to the Society in behalf of the city of Wichita and the citizens of Sedgwick county, by Hon. Rodolph Hatfield, which was responded to by Dr. Charles Williamson in behalf of the Society.

The President announced as next in order the following essay:

HORTICULTURE AS AN INDUSTRY.

BY A. WILLIS, OTTAWA.

It seems well now and then to look over the ground we have traveled, and see how far we have come; to call to mind the obstacles that have hindered our journey; to look around us and see with whom we are traveling; to study for a time the lessons our successes and reverses should teach us;—hence these meetings.

We come here and go there from year to year to extend and receive kindly greetings, to gather lessons of wisdom that shall aid us in our work from those who have achieved success, and to take warning from the rocks and snags from which others have suffered loss, perchance were shipwrecked.

How many in this place have to-day, with a smile on the face and joy in their heart, clasped hands and said, brother and sister, who were a few years ago strangers, and who, but for these meetings, would be strangers to-day; and to the industry of horticulture is this all due. We will for a time consider this subject as it relates to Kansas, for this is our home; here our work has been done, and here our work will be done, and here by success will we gain honor, or by failure suffer reproach.

Thirty years ago, within the borders of Kansas, the industry of horticulture consisted in gathering wild berries, hawthorns and persimmons from the woods; here and there, may-be, some Indian, who had a nearer approach to civilization than his fellows, had planted a few seedling apple trees, and this was all, and it was many years after this before any of the magnificent displays of fruit, for which Kansas has since become famous, and which fill the heart of every Kansan with pride, had been made, while the work of our State Horticultural Society and its auxiliaries, that have done so much to secure to Kansas the high place it holds among its sister States, has nearly all been done within half of that time.

But about thirty years ago a few sanguine horticulturists began to suspect that the great American desert was perhaps not so much of a desert after all, and then, with the word fail blotted out of their dictionaries and "Never give up" for their motto, they came, and amid toil and hardship, privation and adversity, dugged and planted and laid deep and solid the foundation of Kansas horticulture, the foundation on which we are to-day building with hope and success. Some of these noble pioneers sleep to-day beneath the bosom of Mother Earth, and we uncover our heads and do reverence as we speak their names or tread the hallowed ground where they lie, but many of them are still with us, and we sit at their feet and listen with pleasure and profit to their words of wisdom and encouragement.

Does the industry of horticulture mean nothing to them? They learned amid poverty, toil and misfortune the lessons that are given us as certain guides to success; they trod an unknown path in an untried land. They could know nothing except as the result of experiment in unknown fields and under uncertain conditions; but with mental resources that devised new plans when old ones failed, and a faith in ultimate success that loss and disaster could not shake, they toiled on, marking the shoals and quicksands that so nearly wrecked them, as well as the bright spots in their path, the one as a warning, the other as a beacon to guide them to brighter success in the future. Such was the beginning; but Kansas horticulture has been a child of vigorous growth, and to-day stands before the State an industry that produced marketable products in 1884 to the value of about \$2,000,000, besides what was consumed by the producers.

In 1875 there were over 400 persons engaged in the various departments of horticulture. Amount of products not stated; but if the increase in this calling has been

in proportion to that of other callings in the State, we may safely conclude that there are thousands of men actively employed to-day; besides these, most farmers devote a part of their time to the cultivation of orchard and garden, and flower gardens; the same is also true of large numbers of tradesmen, mechanics, professional men, and laborers. The amount of time thus employed is large, and the product, whether we consider its money value, its economic value for food, or its influence on the public health and comfort, is beyond calculation. This is Kansas horticulture to-day. To-day it supplies large quantities of fruits, small and large, fruit trees, vegetables and flowers, to consumers from the Atlantic coast to the Rocky Mountains. These products carry with them a wealth of comfort and luxury beyond calculation to consumers, and bring millions of money in return each year to the producer. It furnishes employment for a large amount of labor and capital. It plants shade and shelter for man and beast. It decorates road-sides, school grounds, church yards, private grounds, cemeteries, and public parks. It has made large advances toward transforming the treeless plains of Kansas into diversified landscapes. It has had such a beneficent influence on the climate of Kansas that from its former reputation for long drouths and burning plains it is rapidly becoming, in climate, as humid and favorable to the production of the fruits of the earth as the most favored portions of our fair land. Its influence in the education of the young is most beneficent and refining. The industry of horticulture to-day is a stalwart youth, with a robust, healthy body, and a studious, inquiring mind, and a boundless ambition.

He sees the difficulties and discouragements that beset his way, but with sunny skies above, and the fertile soil beneath, the idea of failure does not occur to him as among the possibilities, and with the experience and success of his fathers for his guide, he has determined to join the grand forward movement of the century, and march shoulder to shoulder with his fellows in other callings to success in new enterprises and achievements. Do you think he will fail? I will make a prophecy. The day will come when every hilltop will have its grove, and every home its orchard and garden and flower gardens, the road-sides, school grounds, church yards, cemeteries and public grounds be clothed with verdure and beauty; knowledge and a love of the beautiful shall fill the minds of the people, as apathy and ignorance now fill the minds of the masses. This is a great work, and my prophecy looks like a stretch of the imagination; but behold the beginning, the progress, and then know that we are still in the beginning, and you will see that we have reason for hope and confidence.

The day will come when instead of 1,350,000 people, Kansas will have 20,000,000. Fruits, vegetables and flowers must be provided for all these, and for the millions beyond our borders that will demand the products of our calling; there must be pleasure grounds, orchards, gardens and timber plantations for all these people, and the horticulturists of Kansas must arise in their might and do this work. The calling is not one of ease. The Almighty Creator who gave us this beautiful land and commanded the earth to yield her increase has also indelibly stamped on the heart of every horticulturist a command to dress and keep this land so kindly intrusted to his care. He has also commanded them to teach the children—the people—to assist each other, and all who will, to beautify and make productive the trust committed to their care.

It has been said that these horticulturists are an illiterate people, of low social standing, poor, and without influence. Is this true? Are they not as a class frugal, industrious, and does not their very calling excite and develop an amount of intelligence, close study and observation and sound judgment scarcely less than any other

pursuit? They have raised up sons and daughters to become honest men and pure women, and who in all the true and noble virtues are the equals of any in the land. They have demonstrated the possibilities of the resources of the State by many years of labor and costs, produced a literature which the sage might study with profit, and freely and generously given it to the public for the common good without recompense.

The value of the industry of horticulture to Kansas is incalculable. It is almost inseparably connected with the settlement and improvement of every farm and every home. It affords employment to thousands, and comforts and blessings to millions. Its products in various forms enter quite largely into, and have become no insignificant element, in commerce, and a source of large revenue to the State. The horticulturists, united with the noble toilers in the field of agriculture, the two hand in hand, pulling hard together, have brought Kansas to the eminent position she now holds in the sisterhood of States.

Soon the veterans, grown gray in this work, will pass away, but their children will take up the work where they have laid it down; and the industry will grow; each new year will find it growing and spreading and scattering its blessing over broader fields. Generations of men yet unborn will rise up and follow the calling, hallowed by the memories of those who devoted their lives to pioneer work under great privation, hardship, and toil.

Following this essay, blackberry culture was taken up and considered.

DISCUSSION OF BLACKBERRY CULTURE.

HON. E. J. HOLMAN, Leavenworth: In the northern portions of the State the Snyder has become the main dependence; but I find here in the south the Kittatinny is successfully grown, which in former years was also a favorite variety in the north, but is now considered unreliable. The culture of this berry has been profitable on my farm. It has received but little cultivation after the first year planted. All sprouts from the roots, outside of the main row, should be kept cut down to secure the best results in fruit.

HARVEY FENTON, Indianola: In some plantations mulching has been practiced; but I notice that such plants are more liable to the attacks of rust, and are often killed.

WM. McCracken, Sunny Dale: I have a wild variety on my farm, which, though not cultivated, surpasses all other kinds I have ever seen. It has been entirely exempt from rust.

J. G. SAMPSON, Derby: The Kittatinny succeeds on my farm.

WM. CUTTER, Junction City: The Kittatinny suffers from rust in localities where the Snyder does not. Such is the case at Junction City.

R. MILLIKEN, Emporia: I am of the opinion that the "winter-killing" complained of so often is largely due to the effects of the preceding summer. Mulched plants are more liable to such injury than those which have received only good cultivation during the summer, for the reason that the roots of a mulched plant will form near the surface of the ground, hence are sensitive to heat and cold; but I would mulch during winter and cultivate the land in summer. The Snyder is very fruitful—too much so, as much of the crop dries up on the canes before matured, some years. The Western Triumph is as hardy as the Snyder, and the Kittatinny reasonably hardy when treated as above stated.

S. MAXWELL, Arkansas City: I have planted Snyder, Kittatinny, and California Dewberry. The canes of the first two named are annually cut back to about three feet in height. Of these, the Snyder has proven the most satisfactory. The Kitta-

tinny was covered from three to five feet deep with snow the past winter; many were broken down by its weight. The plants failed to leave out at the usual season, but did so quite late, and are now in bloom.

J. W. ROBISON, Towanda: Mulching is practiced in this section with good results. In the northern regions fine cultivation seems best. The Snyder fails to mature its crop, largely from a neglect of proper thinning of the growth. I have never found rust on this variety even when planted by the side of the Kittatinny, among which rust was prevalent.

L. A. SIMMONS, Wellington: In the north the Snyder is a favorite with planters, while in the southern latitudes the Kittatinny is held in high estimate. There it produces a good crop almost every year. I am acquainted with a plantation of this variety now ten years old, in which there has been but one crop failure in the time. This is on the highest rolling prairie land in Sumner county, and has had no other culture than a heavy mulch. Other planters complain of its killing every few years. The Snyder fails to mature properly, dries up on the canes just at the ripening season. The Kittatinny ripens about ten days earlier, and without any such loss.

D. G. WATT, Lawrence: The Early Cluster promises to be a desirable berry of fair size, and the plants are hardy. It may prove a valuable substitute for the Snyder.

On motion, the discussion was closed, to give place to the following essay:

CURRENT CULTURE.

BY DR. CHAS. WILLIAMSON, WASHINGTON.

None of the fruits are more easily raised than the currant, but after planting they are generally left to themselves. The result is they come far short of their capability, in quantity and quality of fruit; yet it is one of the rarest fruits to be found in the garden in Kansas, for the reason that almost everybody claims that you cannot raise currants, and our neighbors accept the situation without giving them a fair trial. I was told this story away back as far as 1856, but in 1858 I visited a nursery two miles east of the village of Easton, in Leavenworth county, and there I found them growing and fruiting as successfully as they do in the Eastern States, or even in England. Ever since that time, in Atchison county, and later in Washington, my table has rarely been without the currant in its season. It fills a place with us between the strawberry and the Turner raspberry. The peculiar flavor of the malic acid of the currant is a pleasant addition to the invalid's bill of fare, for Providence wisely, from the tropics to the poles, furnishes from the shrub, tree and field, the acids that the system both craves and needs, and it is a much more imperative want of man than the pill or prescription of the wisest M. D. in the State.

Of the twenty-five varieties of currants to select from, I have thus far retained the Red and White Dutch, White Grape, Cherry, and Black Naples. On trial, I have Victoria, La Versailles, and Fay's Prolific.

I plant in rows six feet apart and four feet in the row. Vegetables may be grown between them for a couple of years. They require clean cultivation, and should be mulched heavily before warm weather sets in. Partial shade is beneficial if it can be obtained while the plants are growing, and but little pruning is required; after which a renewal of young wood must be kept up, by removing in the fall or early spring part of the old wood.

Currants are sometimes troubled with the stalk-borer in June. The injury done to the bushes is noticeable first in the wilting of the terminal growth of the young shoots, but the injury is more apparent when using the new wood for cuttings in the fall. My remedy has been to cut away all wood over three years old. By that

means I have been able to control it. The currant worm, it is said, may be destroyed by dusting the plants with powdered white hellebore, in May, soon after the eggs are laid. The operation is to be repeated a few weeks later, for the second brood. Pyrethrum will also kill when applied immediately to the worms. Picking off the lower leaves, which are infested with the young worms, has also been recommended, but in my experience in Kansas so far, I have not had to fight them.

To propagate the currant, cut off the wood of the present season's growth as soon as the leaves begin to fall. Then cut the wood into sections seven or eight inches long; tie into bundles of fifty each, lay them in a trench with the butt end up, and cover with two inches of fine soil. By the first of September the cuttings will callous over and send out roots; in from ten to twenty days thereafter, plant them, putting them in with a spade and treading the earth closely around them. I sometimes earth up around the currant bushes in June, about ten inches, to cause roots to form around the base of the branches and shoots. New varieties are often propagated this way. Such of these as are rooted may be transplanted in the spring, leaving the parent plant to remain.

This paper, brief as it may be, is the result of many years' experience, and is the basis of successful currant culture. I submit it with the hope that others may be profited by it.

DISCUSSION OF CURRANT CULTURE.

MAJOR HOLSINGER, Rosedale: This valuable fruit succeeds remarkably well in my locality, either in shade or the open field, on soil rather wet, and in some locations underlaid with hard-pan. The varieties — Cherry, White Grape, and Red Dutch — are highly successful.

J. G. SAMPSON, Derby: The fruit is poor, and plant not a success on my farm.

WM. MCCracken, Sunny Dale: The plant will live on wet land, but die out in three years on a dry soil.

CAPTAIN E. P. DIEHL, Olathe: The currant is grown successfully in Johnson county.

J. F. MARTIN, Winfield: It is not generally a success in Cowley county. In some locations, by the aid of a mulch, it is quite successful. Hot suns seem to debilitate the plants, and blight the fruit.

W. H. LITSON, Benton: This fruit succeeds with me.

J. W. ROBISON, Towanda: The Long-Bunched Red (Holland) is a strong grower, and its leaves continue fresh and active until its fruit ripens.

J. L. WILLIAMS, Oswego: Heavy crops are grown at Oswego, Labette county, and shipped into outside markets.

JAMES SIMPSON, Emporia: The White and Red Dutch are growing finely, and yielding fine crops at Emporia, Lyon county.

On motion, the essay on currant culture was referred to the committee in charge of the Small-Fruit Manual.

Next in order was the following essay:

EMBELLISHMENT OF FARM HOMES.

BY COL. JOHN DAVIS, JUNCTION CITY.

My subject is the embellishment of farm homes, or words to that effect. The very first, last and bottom purpose in all homes should be to promote the health, comfort and cheerfulness of the family. The most perfect, pleasing and lovely embellishments in and about farm homes and all homes, are the rosy cheeks, cheerful dispositions and the sweet, musical voices of the inmates. That is, good family health is the first and best requisite among home embellishments.

Among the necessary means to these essential and closely blended results, it may be said, first, that the location of a farm home should be dry. It should be susceptible of prompt and perfect drainage. Hence, if possible, elevated grounds should be chosen for the family dwelling. Better a little steep than too flat. Where the ground is a dead level a few open furrows may be made with plow and scraper, and may be mounded up about the house, in order to persuade the water to retire. Where there is a basement or cellar, the earth from the excavation may be utilized for the same purpose.

The location chosen and the drainage secured and perfected, then the house must be constructed weather-tight. There should be plenty of doors and windows to let in air and sunshine when needed; but doors, windows, walls, roof and floor should be absolutely wind, water and weather-proof, for perfect protection when required. The roof must not leak, the walls must keep out wet and cold; and equally important, or more important, is a good floor! With an open floor the family feet are cold in winter, and the family nostrils are offended in hot weather! Both influences are bad for health, comfort, and cheerfulness.

Next to good drainage and protection from the weather, come pure water and air. If rain-water is used, it must be filtered, and the cistern must be deep enough to preserve the water cool and pure. If well water, it must come from a clean well, stirred and used daily, and protected from outside impurities; especially from the stealthy, unobserved and poisonous drainage from filthy yards, pools and privies.

To secure good air, shun the miasms of swamps and stagnant water. If near such localities, build south of them rather than north, so that it will be a cold wind rather than a warm or hot one that blows from the swamp toward the dwelling.

After good drainage, a good house, pure water and pure air have been thought of, we must then look out for the wind and the sunshine. In an open, bleak, prairie, sunny climate it is important that the force of the winds and the heat of the sun be broken; not shut out entirely, but *tempered*. To do this use trees. In the use of trees we combine utility and beauty. The strongest and most objectionable winds in Kansas come from the north and northwest in winter, and from the south and southwest in summer, hence the dwelling house, if practicable, should front the east. For winter protection there should be trees on the north, northwest and west, that hold their leaves in winter. They should be set thickly, to break the force of the winds, but not too close to the house, to cause aerial stagnation in summer.

On the south and southwest, trees should be used that shed their leaves in autumn, so as to invite all the sunshine possible in winter. On the east and southeast, trees must be used very sparingly. Low shrubbery and flowering plants, with here and there a good shade tree, is best. Every dwelling should receive the sunshine freely in the morning, and if the locality is inclined to be damp, mouldy and chilly, the sunshine should be admitted pretty freely all day. Much ill-health is caused, even in sunny Kansas, by too much shade close about the dwelling. Men set trees thickly, and when they are small it is all right. When the trees get large, few men have the courage to thin them sufficiently. These facts and features are intensified in moist, miasmatic regions, and become of very great importance. In the miasmatic regions of some of the older States, observant men can point out, with considerable certainty, the homes, in city and country, that contain invalids.

They uniformly consider heavy masses of shade to the east and south of a dwelling as deleterious to health. Dio Lewis has emphasized the importance of sunshine to health with great earnestness. He records numerous cases where chronic invalids were utterly incurable until the great oaks and elms that brooded over the dwellings and door-yards, with their thick, impenetrable shades, were removed. Every part of

the roof of the dwelling, and every foot of turf in the door-yard, should receive the direct rays of the sun a portion of every day, if practicable; and as much as possible in the forenoon.

As to the varieties of trees, the red cedar and Austrian pine, being exceedingly hardy in Kansas, should be used plentifully on the cold sides of a dwelling, and very sparingly on the east and south. Other trees and shrubs can be mixed in to suit individual tastes for winter and summer effect. Among deciduous trees, soft maple, elm, ash, black walnut, box elder, mulberry, coffee nut, wild cherry, honey locust, and cottonwood are used to good advantage. The taller trees should be placed in the background, on the north and west, the low-growers scattered thinly on the east and south.

For shrubs and flowers, each person's local observations are the best guide, but the roses, in numberless hardy varieties, are very useful as beautifiers of farm homes.

Then come the fruit trees, vines and bushes, combining beauty and utility. Orchard trees may be so placed as to afford shade, shelter, and ornament. The beautiful flowers of the cherry and apple in spring, and the ripe fruit in summer and autumn, are embellishments that add vastly to the beauty, comfort and value of a farm home. The fruit garden and vineyard, flanking the front lawn and flower garden, but not displacing them, are sources of health, profit, and pleasure. Their beauty, when properly placed and tended, all will admit.

Connected with the desirable requisite for a comfortable and beautiful farm home, two points must not be forgotten; first, a fertile soil capable of growing trees and plants, or one that may be made so by reasonable culture and management; second, a desirable view over the surrounding landscape. Both of these requisites are easily found on most Kansas farms. The first makes the growth of trees and plants practicable. The last agrees well with good drainage and pure air. This last requisite is very desirable and should be chosen, even at some sacrifice of fertility of soil.

Farm embellishments have their difficulties and drawbacks in many ways. We meet with hot suns and cold winters; there are storms and drouths, insects, blights, and mildews. These are unavoidable, but with proper planning, care, attention and culture, may be mitigated and mostly overcome. Another enemy is the State. In most States men are fined by law for improving and embellishing their homes. A farm of 160 acres, occupied by a tenant cabin, a straw stable, a pig sty, and a cow corral in front, is taxed somewhat above the rate of raw prairie; yet the price of the rude, simple crops may, in a measure, justify increased taxation.

Now let the same farm of 160 acres contain a \$2,000 dwelling and other buildings and improvements, neat and tidy, amounting to another \$2,000, with orchards, groves, wind-breaks and tasty embellishments, and the taxes are doubled, trebled or quadrupled. This is *fining* a man for improving and beautifying his home.

Kansas is not worse than other States in this respect, if as bad. Yet, if one man lives in a cabin, with straw sheds for animals, he has the same tax deduction on the assessor's book as his neighbor with good, comfortable house and barn, and grounds nicely laid out, improved and embellished; though the highly-improved place is assessed much higher than the happy-go-lucky straw-shed farm. Kansas, like other States, *fines her people by increased taxation* for the improvement of their homes!

It is said that a certain British lord, Sir William Scully, who owns a hundred thousand acres of Illinois soil and as much or more in Kansas, deliberately avoids neat and tasty improvements for his tenants, in order to escape taxation. His lands in Illinois are notable for poor improvements and low taxation. It is also said that tenants in Ireland avoid improvements of property and tidiness of premises, lest their rents may be raised.

Human nature is much the same in all States, and on both sides of the Atlantic. Men should *not* be fined and taxed for farm improvements and home embellishments. Taxes should be levied on *land values only*! Then it would not be so common for men to hold raw lands for speculation, or for slipshod farmers to occupy large tracts of country with poor improvements and low taxes, while the highly-improved and neatly-kept and embellished homes are taxed to discouragement and bankruptcy because of their neatness and comfort! Let taxes be levied on land values only. Let it no longer be considered a crime, deserving fines, pains and penalties for men to cultivate the soil, or to improve and embellish their homes. Surely the austerities of nature, and the depredations of birds, beasts and insects, are drawbacks enough. Society in the concrete should not attack the individual. Savagery and barbarism should not be favored with lighter taxes, while cultivation, comfort and beauty are loaded with pains and penalties. The first move now needed is to place the laws of the State on the side of home comforts and home embellishments! It is within the power of the State Legislature to relieve farm improvements from taxation, and to make up the deficiency by increased rates on naked lands. Such a policy would decrease the acreage of many half-improved farms, but it would vastly improve the style of farming, and the frequency, quantity and quality of home improvements and home embellishments. In my opinion such a policy is the next necessity for the encouragement of home embellishments.

Adjourned to 8 o'clock A. M. the following day.

SECOND DAY—MORNING SESSION.

WEDNESDAY, JUNE 30, 1886.

President Johnson in the chair. On motion it was decided to spend a portion of the morning session in listening to reports of the present and prospective conditions in the several counties represented at the meeting.

COUNTY REPORTS.

BUTLER COUNTY.

By W. H. LITSON, Benton: The condition of all fruit trees is good, excepting old peach and some of the cherry trees. Of apples, the Winesap is carrying the heaviest crop of fruit; Carolina June and Rome Beauty a full crop; Rawle's Genet has failed this season; pears will be less than half a crop; plums and cherries, light; apricots were killed by the last winter; strawberries dried up on the vines; raspberry, Tyler and Gregg—Blackcap varieties—good, Turner and Cuthbert, a full crop; gooseberry, very light; currant, in the towns, good; blackberry, Kittatinny and Snyder are each carrying a good crop.

COWLEY COUNTY.

By J. NIXON, Kellogg: The apple crop will hardly be an average one; early kinds bore heavily; the later have dropped quite largely in many orchards from the effects of the codling moth; pears, will yield an average crop—only a few cases of blight have occurred; strawberry, the first picking was good—drouth reduced the main crop materially; blackberry, a full crop; gooseberry, light; cherry and plum, very light; grapes, extra good, no rot or disease has affected the fruit or vines.

DAVIS COUNTY.

By WM. CUTTER, Junction City : Orchard trees and their fruit are not as promising as in 1885. The roots of both old and young apple trees are injured. Apples will yield about half a crop; cherry, about the same; plum, a full crop. In my recent visit through McPherson county, I found that all the fruit of the Russian apricot had been killed, either by the winter or spring frosts. Quince trees are suffering from blight, and the crop will not be equal to former years. Blackberry, the Snyder will produce half a crop; raspberry, the Gregg is hardy and best sort; strawberry yielded half a crop.

DOUGLAS COUNTY.

By D. G. WATT, Lawrence : The conditions of orchards are quite good, excepting of the peach, which are generally dead or dying in old plantations. Some few apple trees are debilitated and dying. In crops, the Winesap is carrying the best yield. The main crop will be fairly good; cherry, good; plum, fair. Strawberry produced a heavy yield of fine character. My own plantation yielded at the rate of 120 bushels per acre, while another yielded a little over 100 bushels per acre. The gooseberry crop will be short; currant, fairly good; grape, full, with very little tendency to rot. Of pears, the Seckel is quite full, and the trees mostly healthy. The general crop will be light.

FRANKLIN COUNTY.

By A. H. SELLERS, Ottawa : The apple crop will not be heavy in my county.

JACKSON COUNTY.

By D. BLOSSEE, Holton : Orchard trees are generally healthy, excepting a few varieties of apple which are suffering from blight, it being very severe on the Willow Twig and Crabs. The crop will be a full average and of good quality. Small fruits do well; strawberry crop better than usual; raspberry, good; blackberry, slightly hurt—Snyder the least, and is the best; currant, fair; grape, full, when set, but was severely reduced by a hail storm subsequently.

JOHNSON COUNTY.

By E. P. DIEHL, Olathe : Crop will be: Apples, 80 per cent.; pear, 60 per cent.; peach, a failure; cherry, plum and grapes, good—very little rot in vineyards. Small fruits are generally promising. Strawberry, abundant—one planting of the Sharpless yielded 3,500 quarts per acre, sold at an average of 10½ cents per quart; raspberry crop, 75 per cent.; blackberry, full; Juneberry, heavy; currant, abundant.

LABETTE COUNTY.

By J. L. WILLIAMS, Oswego : Crops: Apple, 60 per cent.; pears and plums, 50 per cent.; blackberry and raspberry, 100 per cent.; gooseberry, 80 per cent.; grape, 100 per cent.; currants, set full, but were thinned lightly by drouth.

LEAVENWORTH COUNTY.

By E. J. HOLMAN, Leavenworth : The conditions of trees and plants are generally good. Very light form of blight has appeared in the apple orchard and some among the pears. The noted "Kieffer" pear tree has blighted to the ground. Of the crops, apple will be heavy and fine appearing; pear, light—the Seckel is the best in tree and fruit; cherry, Morellos and Early Richmond, full; plum, Wild Goose full, Egg varieties fair; grape, not a full crop, but promising in quality; raspberry—Blackcap varieties, Souhegan, Hopkins, Gregg and Ohio, and the red sorts—Turner, Brandywine, Cuthbert and Shaffer, are doing well; blackberry, Snyder and Wilson jr. are both larger and better than the Kittatinny—the last named should be protected during winter.

LYON COUNTY.

By JAMES SIMPSON, Emporia: The general condition of plantations, fairly good. Some twig-blight is found among apple trees, and a very damaging condition among some varieties of pears. Crops: Some apple orchards are carrying very full, while others only a half a crop; pears, where the trees are healthy, full; cherry, full; peach, where the branches were protected, are loaded with fruit. Small fruits, all classes good, except the strawberry, which was reduced by drouth.

RENO COUNTY.

By W. J. ROSS, Pretty Prairie: Apple, trees fair and healthy, crop light—Jonathan most promising; cherry, trees bloomed light, consequently the crop was light; grape, full; currant, common sorts failed, while the hardy, wild black variety is productive.

By J. E. WHITE, Kent: The condition of fruit trees generally good, with no appearance of blight among either the apple or pear. Crops of orchard fruits were almost totally ruined by a heavy frost on the night of the 29th of April, when the fruit buds were quite advanced. Small fruits: Strawberry and raspberry a complete success.

By W. E. FOSNOT, Hutchinson: The apple crop is not as good as in 1885; pear a good crop, and trees are free from any blight. Small fruits are a general success.

RICE COUNTY.

By J. B. SCHLICHTER, Sterling: Apple trees are in a good condition, bloomed freely, but failed largely to set fruit, hence the crop will be light, not above one-fourth. Cherry, light; plum, largely injured by the curculio; peach trees are largely injured, and failed in a crop; pear crop light—a single case of blight, and the first known in the county, was found this season; grape crop, heavy; strawberry, cut short by drouth; gooseberry, full; raspberry, early varieties dried up on the plants, late, both Gregg and Turner bore a good crop; blackberry canes were injured only in neglected plantations.

SEDGWICK COUNTY.

By R. E. LAWRENCE, Wichita: I cannot speak for the whole county, but for the valley around this city, where the apple crop will be good; pear, fair, with no blight of the trees; currant, in the city gardens good, outside, not so good; grape, full, no tendency to rot; small fruits, all promising a good crop. The strawberry was materially reduced by a drouth during its ripening season.

By J. G. SAMPSON, Derby: Of the crops, apple orchards on the river bottoms are carrying a splendid crop, while on the high lands there is a failure in quantity, and the product is knotty and scabbed. Pear trees are loaded with a fine product and are healthy; no blight has appeared to date. Peaches—I have found one specimen in the county, and it was grown on a protected branch. Cherry trees produced about enough fruit for the birds. Small fruits: Where the plants were watered, all classes are healthy and promise good crops.

STAFFORD COUNTY.

By C. G. McNEIL, Stafford: Apple trees are in good thrift, and some are bearing lightly of fine fruit. There are some promising seedling pear trees in the county, a report of which may be given hereafter. The native black currant is very fruitful. Its fruit makes a good jelly, which is an excellent tonic for sick people. The old Yankee barberry thrives and fruits well where planted in the county.

SUMNER COUNTY.

By H. C. ST. CLAIR, Belle Plaine: Orchard trees are in fine condition, excepting the peach, and are carrying a full crop of fine fruit, especially pear trees, which are full, and the branches bending under their load. A small per cent. of the spring planting failed; but the farmers plant and keep planting each year. The Snyder blackberry is all right for my county; Kittatinny and Lawton were lightly injured by the cold of last winter. Strawberry plantations yielded a heavy crop of large berries.

WILSON COUNTY.

G. F. JACKSON, Fredonia: Apple trees are in good condition, showing very little tendency to "twig blight," and are carrying a full crop of fruit; pear, Bartlett and a variety of the Bergamotte family, a full crop. The [Duchesse de] Angouleme blights heavily. A removal of the blighted branches, so far, does stop its spreading; plum, Wild Goose, is a success in both tree and fruit; cherry is a good crop, free from worms, (curculios.)

WASHINGTON COUNTY.

DR. CHAS. WILLIAMSON, Washington: Crops—Apple, 80 per cent.; peach, 5 per cent.; pear, 50 per cent.; all classes of small fruit, good. Several planters are growing the peach tree in espalier form, to be able to protect it during winter.

WIANDOTTE COUNTY.

MAJ. HOLSINGER: The apple crop will be heavy; cherry, 75 per cent.; pear, 25 per cent.; plum, 50 per cent.; blackberry, 75 per cent.; currant, gooseberry, raspberry, and grapes, 100 per cent.; strawberry yielded fully 75 per cent. of a crop. The gooseberry is a profitable fruit to grow near our large cities. It can be picked rapidly and sold in the Kansas City market at \$3.50 per case of twenty-four quarts the present season.

On motion, the reports for counties was suspended, and a paper read on the

HANDLING OF SMALL FRUITS.

BY MAJ. F. HOLSINGER, ROSEDALE.

Possibly there has been as much progress in the handling of fruit during the past twenty years as in any other branch of industry. Think for a moment that in St. Louis, the then great city of the West, that there existed in 1866 only one commission house that was devoted to handling fruit, and that ample to take care of all the fruit consigned to that great market. Then Kansas City was without anything of the kind; now there are possibly 100 firms devoted to this trade, and all doing an immense business.

With each new railroad new fields are opened up, and with it new supplies. Twenty years ago the fruit season did not continue beyond six weeks, now, in the market of St. Louis and Kansas City they are drawn out to eight months, beginning in April with the luscious strawberries of the extreme South, and ending with the grapes and peaches of the extreme North. Fruit as an article of food is admitted by all to be healthful. The more fruit we consume the healthier we become as a people and the less we have to resort to doctors.

The business of fruit-growing is fully as remunerative as almost any other, requires less capital but greater intelligence, and, if properly followed, places the grower on a higher industrial plane. It is less uncertain in the elements of risks than are many enterprises, and is in consequence a more inviting field for men of limited means.

Possibly the most encouraging feature in connection with the growing of fruits

and vegetables is the wonderful progress made towards utilizing the surplus. The past few years introduced so many new and approved evaporators and fruit-dryers that a fresh impetus is given to the business.

The canning industry has also made rapid strides, and canning factories are springing up in every village in the West. Already some of the large canning houses of the East are contemplating branch houses in the West, where the supply is cheap and abundant, and where their goods are in demand. They realize that there is money in these new fields which a little enterprise and capital can acquire.

Wherever these enterprises have been started they have been prosperous, and a market has been found for their goods at remunerative prices, and no longer does the question exercise the successful grower of fruit, "What shall I do with my surplus?" The demand has become more universal, and the industry of growing and shipping has become so immense, that now fruits and vegetables are within the reach of all.

PICKING AND PACKING FRUIT.

The first in importance to be considered is the picking. I have found the following method both simple and successful, viz.: Each picker is furnished with an ordinary splint five-cent basket, with his name written on it. In this are placed four or eight berry boxes—the octagon form preferred—and all sound and marketable-sized berries are carefully placed in boxes by themselves, and the defective and small fruit in others, avoiding handling it more than is absolutely necessary. In handling strawberries it is a common practice to face the top of boxes, which is done by turning all the berries of the top layer with stem end down. The practice of some growers, of placing the largest berries in the top layer, will not pay in a long run. Any kind of deception in this line of traffic will soon be found out, and all honest dealers will refuse to purchase or handle such goods. An honestly-packed lot of fruit will command a ready sale.

This was followed with an essay on—

MISTAKES AND EXPERIENCE IN HORTICULTURE.

BY DR. CHAS. WILLIAMSON, WASHINGTON.

In practical horticulture we find many things to learn as well as unlearn, and some of our best ideas are picked up by the wayside, the donor probably being too modest or too weary as a bread-winner in his own industrial home to attend the meetings of either his own county or State horticultural society. To a large extent we are the gleaners of one another's experience, and although we have the past and the present to stimulate and to encourage us, we still realize that there is a persistent and continued battle to be fought, the results of which add to the material prosperity, happiness and health of every home in Kansas, and richly deserves the appreciative, fostering care given to it by our legislators. In the northwest and southwest, in the south-central and eastern portions of our State, even to the utmost limits of the newer parts of western Kansas, millions of trees, plants and shrubs are being planted, and even now our western homestead area—once known as a desert—looks as if the magician's wand had passed over it, marking an oasis with trees and shrubs, where but a short time since the Indian, buffalo, and antelope roamed at will.

Still, we have enemies in our insect foes, our hot summer sun, southwest winds, occasionally severe winters—for this climate, and late frosts; but last, although not least by any means, is the smooth, suave and unprincipled dude that visits our suburban homes twice a year under the guise of a *tree peddler*, having pictures of strawberries growing on trees, two-year-old Russian roots raised on the Kaw—with two-year-old cions to match, with a pledge that they'll bear fruit in two years or

more, and a patent method of pruning peach trees so that they will bear every year, even though the mercury falls 40 degrees below zero in the winter. With an eye single to our pocketbook, he sizes us up or down (call it what you please). Snugly wrapt in his own conceit, he disdains the teachings of the voted fruit list of our Society; being wise in his generation, his labels never fail to give the desired variety. When I see him coming over the prairie toward the house, I am led to exclaim, as Robert Burns did to the witches and warlocks and long-nabbed things that gang among the heather, "Good Lord, deliver us!"

The A B C of horticulture in Kansas in its earliest days were copied from Missouri, but, like the French alphabet, it had a letter left out. It taught us first, that, plant as we might, we could not be successful, or, in other words, an apple grown in Kansas would need a wire stem to keep the winds from blowing it off the tree. Others taught that any variety of trees successful in the Eastern States would be equally so here. Both were errors. It also taught that fruit trees in the orchard should have their stems trimmed up, so that a wagon could be driven under the limbs; also, that they should be planted close together for mutual protection, and to plant the tree perpendicular; wind-breaks were considered unnecessary.

All these were mistakes; for the sun scalded the bark on the south side, and then the borer made his home there, destroying the tree. The close planting necessitated the removal of one-half the trees when they came into bearing. If planted upright, in a few years the southwest winds would lean them to the northeast, thus causing an effort to be made to get them back again.

Now, in setting trees, we lean them to the southwest, while the wind-breaks on the south and west have made one-half difference in the amount of fruit raised when they commence to bear, as well as in the successful growing of the young orchard tree.

Then, again, we planted too many varieties of apples, especially summer apples, and when our trees came into bearing, we had not enough of any good variety to market. When we were taking these early lessons, we did not have the voted fruit list of the State Horticultural Society for our primer. Hence, each settler selected the variety he preferred in the State from whence he came. We now plant fewer varieties, and these are tested by the experience of other orchardists all over the State.

Another early lesson was not to mulch, but water the trees, all through the season. That leaf in the primer was a dear one to me, for I lost plenty of trees every season, and too often blamed the nurserymen for it; but in dry years, like 1860, the water gave out, and we went to mulching, and have mulched ever since. Others said we must cultivate all the time, but the early settler had to turn so many ways to keep the wolf from the door that he preferred to let the earth-worm do his plowing under the mulch, thus helping him still to make a success of it.

The next drawback was, our apple trees took the blight—pear trees, too, and they were the worst of all—root and top included, and some of us almost gave up in despair; but of later years we have changed the name, calling it winter-killed. With the apple, we now try to mature all wood ready for winter, and never cultivate later than June. With the pear, we cut back a portion of the growth, so that no immature wood goes into winter quarters; and later, taking a lesson from a Swiss horticulturist, when pear trees are injured by blight (*alias* winter-killing), sun-scald, etc. (for the bark of the body of a tree needs an umbrella or other shade on the south side, in the hot summer days, as much as a man), some clay, mixed like mortar, put on two or three inches thick around the trunk of the tree, and a little upon the limbs where the bark is black and dry, and wound around with cotton cloths, is a good remedy. In the fall you will find a new bark, and the dead outside scaling off. This was a

wayside idea or lesson, a surprise to me; but such things may come to any one of us who travels through the world with his eyes and ears open.

No tree is as much at home in Kansas soil as the cherry. My first lesson was that the May Duke and Early Richmond were the only kinds that would succeed in our climate, but I find every year a new name added to the list. My best cherry is an accidental seeding of the Early Richmond.

I have this to say for the benefit of northwest and southwest Kansas, having passed through all the ups and down of homestead pioneer life and experience, and it is a summing-up of my experimental work on the frontier in the last eighteen or twenty years, and near thirty, including Territorial days: That it is no sign that, because you cannot cultivate a certain kind or class of fruit to-day, you may not do it a few years hence. This is a part of our horticultural history that is repeating itself all over the State, including small fruits and shrubs. It is Washington county's history, and this success comes with the settlement of the country and the increased rainfall that follows as the result of cultivation, stoppage of prairie fires, and the planting of trees. The birds in their migratory annual visits help to plant on the creeks the seeds of wild fruits and timber, which with the reserved store placed there by Providence, (for we now realize that when cutting off the stunted, prairie-burnt white elms, a different growth of more valuable timber takes its place,) stimulated the energies of the first settler with the promise of better things to come in the future, and for some reason, which I am not ready to explain, as soon as tame fruit becomes abundant the wild dwindles and ceases to be, even in its old haunts.

Now, in northern and eastern Kansas, what of promise does our lesson give us in peach culture? In the past, one crop in six years was all we looked for, and often more than we got. In Washington county, one year in four, and still farther west, in Jewell county, the crop becomes more certain, that following very hard winters being the exception. Is it not possible to do better in northern and western Kansas? I say yes. But we must not persist in planting and trimming the peach the same as the apple, unless to fail!

When we look for peaches, even in one of our worst years, they are found on the end of the limbs that lie close to the ground. Even this year, following one of our hardest winters, we have a few peaches where the earth prevented premature development of buds. Then why not cut out the leader, and train the limbs horizontally, close to the ground, or in a fan-shape, against fence or stakes, as the apricot and nectarine are raised in England, covering them in winter with matting or cornstalks? It will pay us to do so, whenever we get ready to get out of the old ruts, for it has proved a success as far north as Des Moines, Iowa. Then why not here in Kansas? We have in Washington county been substituting the Russian apricot, which is hardier than the peach, easily propagated from seed or cutting, and bears in three years from planting. It is also a success in Nebraska. In horticulture we have much yet to learn, and the limit of experiment, research and experience is not yet reached.

The State of Iowa has pushed her investigation even into central Asia, and by experiments in her Agricultural College; and even Kansas has much to hope from the investigations of the Iowa State Horticultural Society in their experiments with the hardy, thick-leaved Russian fruits. Chas. Gibbs, of the Province of Quebec, a noted horticulturist, and J. L. Budd, of the Iowa Agricultural College, visited in 1882, the two great plains of northern Europe, which are said to be the counterpart [?] of our Western prairies, covering like a blanket the larger part of continental Europe on the northeast, and passing, without elevations, into the plains of northern Asia. This wonderful plain is washed on the north by the frigid ocean, on the west and south by the inland Baltic, the Caspian and Black seas, and includes all of Russia in Europe. On the Volga, the annual rainfall, summer heat and aridity of air are simi-

lar to western Kansas and Nebraska. The geological formation is the same as ours. The melon and tomato flourish there, and dent corn ripens perfectly. It is nothing uncommon to find cherry orchards in the Province of Vladimer of 15,000 trees, and such is their abundance that Vladimer cherries are cheap in every Russian city reached by rail, in their season. On the Volga, which is noted for its apples, history traces them back to the time when Rurick was on the throne, in the year 850, and yet, in this climate, the winter temperature often gets below zero 50 degrees Fahr. The hardiness of the northern pears of this region is surprising. The seedling varieties are used for park and other shade trees, and live where the northern poplar dies. There are many varieties of the Russian wild Bergamot pears from this region, which, as the result of experiments made at the Iowa Agricultural College, have stood the test of winters that have killed the Flemish Beauty. I cite the above to show the necessity of experimental work in our own State with these hardy fruits. Individual experiment is not sufficient, but should be aided by a small appropriation from the State, which, with a small profit from the sale of these trees, in their distribution all over the State, would be of great benefit to all. Too many of us are apt to lack faith in ourselves and in the outcome of the fruit interests of our western counties. However, as a pioneer, I am not one of that number.

When the craggy heights and sides of Lookout Mountain — which our brave boys in blue, midst the roar of cannon and the rattle of musketry, baptized with their blood — can be cultivated from valley to hill-top with strawberries and vines, and the land which was once considered worthless, stirred as it were by the magic of the skilled horticulturist, has now reached the fabulous price of \$800 per acre, who is there here, as they look over the homestead area of counties of north and southwestern Kansas, but will exclaim with me, that the sons and daughters of our dead heroes who have settled there — for Kansas is truly the soldier's home — have both the courage and the will to make there a paradise of happy homes that shall blossom as the rose?

On motion, the meeting adjourned to 2 o'clock P. M.

AFTERNOON SESSION.

WEDNESDAY, June 30, 1886.

President Johnson in the chair. On motion, the following committees were appointed:

On Fruits Exhibited during the Meeting — E. J. Holman, J. L. Williams, H. C. St. Clair.

On Final Resolutions — J. B. Schlichter, A. Willis, G. F. Jackson.

The President announced as in order of the programme, the following essay:

THE RELATIONS OF THE NATURAL SCIENCES TO HORTICULTURE.

BY L. A. SIMMONS, WELLINGTON.

The relation which the natural sciences have to horticulture is not to such an extent unknown, as it is unacknowledged. The facts established by these sciences, and the principles explained by them, have, it is well known, thrown a wonderful light upon the operations of nature, revealed the inherent forces, and traced out the causes of many of the phenomena which we observe each day of our lives; and yet there seems to be a remarkable reluctance on the part of many to give to the sciences the credit they actually deserve, or even to mention them by name. Why is it, in this progressive age, whose tendency is to render scientific knowledge available, and to utilize its discoveries in every vocation, that so few horticultural

writers barely allude to the principles of geology, meteorology and the other kindred sciences? All who speak or write on any branch of practical horticulture, invariably mention varieties of soil and peculiarities of climate, yet how few allude directly to the sciences which furnish the only explanation of the causes of such varieties and peculiarities? Why is it that our horticultural writer have so much to say about soils, yet seldom refer to the elements of geology and mineralogy as furnishing a satisfactory explanation of their origin, formation, and ingredients? Why do they say so much about climate and the effects of weather, yet scarcely mention meteorology? Why do they dwell upon the growth of trees and plants and the varieties of fruit, yet persistently refrain from touching upon the principles of vegetable physiology and botany? How much is said in our agricultural and horticultural journals about manures and fertilizers, and yet how many writers refrain from the least possible allusion to agricultural chemistry! Is the use of a word ending in "ology" unpleasant to the ear of the hearer, or injurious to the eye of the reader? Is there any good reason for speaking in a cursory and superficial way, or in uncertain and indefinite terms, of matters in respect to which we have definite and thorough scientific knowledge? I trust not, for the day of sneering at "book farming" is of the past. The practical farmers and horticulturists of to-day have departed from the "good old ways" of their ancestors, and not only read with interest their monthly and weekly papers or periodicals, but seek volume after volume of the treatises or essays on all topics pertaining to their vocations, and the annual reports of State and national societies. At their homes, by their firesides, they intently peruse the records of the experiments and experience of their co-workers, compare and study the results attained at experimental stations and agricultural colleges, seeking to keep abreast the rapid current of the age, to know that they may apply the results of systematic and scientific investigation in their daily vocation. The desire to know the why and the wherefore, to understand the primary causes by which common as well as novel effects are produced in the preparation of soils, and to foster the growth, preserve the healthfulness and increase the productiveness of plants and trees, has now become general; and with this desire is joined the earnest inclination to make a practical use of the facts and principles established by scientific research, to the end that better work may be done, useless experiments avoided, and better crops obtained from field, orchard, and garden. Hence I do not hesitate to present to this intelligent society my views of the relations which geology and other natural sciences have to practical horticulture.

The horticulturist is necessarily compelled to study geology, if he seeks to know the origin and formation of soils; if he wishes clearly to distinguish the varieties which exist and their combinations. Further, if he would fully comprehend why certain soils, one and others, are not suitable to his purpose, he must fully understand their composition and know what organic or inorganic elements are combined in their make-up or constitution.

Hence he speedily perceives that some knowledge of the science of mineralogy is essential, for while he learns that in all productive soils silica, alumina and calcium (known to all as sand, clay and lime) are the principal constituents, he soon discovers that these are always found in combination with eight or ten other inorganic or mineral elements, as well as the essential organic element termed humus, which is produced in and upon the surface by the decay of vegetable matter.

To separate the inorganic from the organic portions, and ascertain the proportion or comparative quantity of each of the mineral elements in the combination known as soil, he turns for aid to the science of chemistry, and by careful analysis finds how many parts of each hundred in the soil are silica, lime, iron, or other mineral, as well as what is composed of matter of vegetable origin.

If, having reached this point of investigation, he would know the actual connection and relations of the soil to plant growth, know what organic as well as inorganic elements may contribute to the vigorous growth of trees, shrubs and plants, in what manner the mineral elements of the soil are absorbed or imbibed by the roots, conveyed to the branches and leaves in the sap, and there changed and modified by the action of heat, light and air, so as to become assimilated by the growing plant and incorporated with it as a constituent part; in brief, if he would comprehend how that which was in the soil becomes a part of the tree or plant, how the inorganic is transformed into the organic, he must understand that portion of the science of botany known as vegetable physiology.

Hence, if we would be thorough horticulturists, it is evident we must have more than a slight or superficial knowledge of the several natural sciences, and although the origin of plant as well as animal life is yet unascertained, and may ever remain a secret beyond the range of mortal investigation, yet the conditions and incidents thereof are in part discovered by close and persistent observation, while others are revealed by scientific research. Again, is it not a great source of pleasure as well as profit to know the relations of the soil to plant growth? When and by what means the dead, inert matter of the soil becomes a living portion of the tree or plant? How the minerals which we know exist in the soil and subsoil are transformed to and become a part of the body and branches of the tree? What combination of elements in the soil induce the most vigorous growth of the tree, and insure the most bountiful crop of luscious fruit?

Now as we term those soils rich which in their natural state contain an abundant supply of plant food in such condition that it is available, have learned that a portion of this plant food is of a mineral nature, and know that by the cultivation of the soil such chemical changes take place in it that plant food is more rapidly prepared for the use of the tree, and utilized in its growth, it seems of the first importance to ascertain definitely what the mineral constituents of the soil are, the quantity of each contained in the soil of our orchards and gardens, for without this we cannot say of which one or more there is an excess, or of which a scarcity; of what elements it has a surplus, in what it is deficient, and hence are unprepared to apply fertilizers or manures intelligently, and are wholly in the dark as to what to apply to neutralize any injurious element, what to use to increase its capacity, in preparation of the nutrition which our plants and trees so constantly demand.

To be prepared, then, for our work as skillful horticulturists, we must know first what the mineral elements are, which are contained in the stalk of the plant or wood of the tree which we propose to cultivate; and secondly, what are contained in the soils of our orchards and gardens, and in what combination.

Now, as the ashes of any wood or matured plant growth contain the portion derived from the soil, and as it has been ascertained by the careful analysis of the ash of the wood of apple, pear and other kinds of trees, as well as the stalk and grain of corn, wheat, etc., the stalk and seed of beans, peas, etc., what mineral elements enter into their composition, and these elements having been found very nearly the same in every instance, regardless of climate or other conditions under which they grow, when we have a table or statement of these analyses before us, we have only to make an analysis of our soils, and if we find they contain an abundance of the same mineral elements as are found in the ashes of the wood of the trees we wish to plant, we may safely conclude they are naturally capable of furnishing an ample supply of proper telluric food; and if upon trial they fail to do so, we know at once that for some reason such plant food existing in the soil is not available; in other words, has not undergone the chemical changes which prepare it for assimilation by our chosen tree or plant, and hence we are able to learn what fertilizer, what manure,

will induce the changes, or set free and prepare this mineral element of tree or plant for speedy and constant use.

The ash of the apple-tree wood is found to contain the same elements, but in different proportions in the sap-wood, and in the inner and darker portion termed heart-wood, as will be noticed in the following table; the analysis showing the proportion of each mineral in the 100 parts:

ANALYSIS OF THE ASH OF THE APPLE.

<i>Elements.</i>	<i>Sap-wood.</i>	<i>Heart-wood.</i>
Potash.....	16.19	6.620
Soda.....	3.11	7.935
Chloride of sodium.....	0.42	0.210
Sulphate of lime.....	0.05	0.526
Phosphate of per-oxide of iron.....	0.80	0.500
Phosphate of lime.....	17.50	5.210
Phosphate of magnesia.....	0.20	0.190
Carbonic acid.....	29.10	34.275
Lime.....	18.63	35.019
Magnesia.....	8.40	6.900
Silica.....	1.65	0.700
Organic matter.....	4.60	2.450
Totals.....	100.65	100.535

The mineral elements differ, but not widely in all our fruit-bearing trees, and for the sake of comparison, I present the following:

ANALYSIS OF THE ASH OF THE PEAR.

<i>Elements.</i>	<i>Sap-wood.</i>	<i>Heart-wood.</i>
Potash.....	22.25	26.94
Soda.....	1.84	Trace.
Chlorine.....	0.31	0.21
Sulphuric acid.....	0.50	0.45
Phosphate of lime.....	27.22	22.40
Phosphate of per-oxide of iron.....	0.31	0.80
Carbonic acid.....	27.69	27.48
Lime.....	12.64	13.14
Magnesia.....	3.00	2.93
Silica.....	0.30	0.30
Coal.....	0.17	1.00
Organic matter.....	4.02	5.00
Totals.....	100.25	100.65

As actual experience has proven that the soils which yield an abundant crop of wheat, or in fact any of the cereals, is, as a general rule, suitable for an orchard or fruit garden, in this connection I place another table of the ash of wheat.

According to the analysis of Sprengel, 1,000 pounds of wheat will leave 11.77 pounds, and of wheat straw, 35.18 pounds of ash, consisting of:

	<i>Grain of wheat, in lbs.</i>	<i>Straw of wheat, in lbs.</i>
Potash.....	2.25	0.20
Soda.....	2.40	0.29
Lime.....	0.96	2.40
Magnesia.....	0.90	0.32
Alumina, with a trace of iron.....	0.26	0.90
Silica.....	4.00	28.70
Sulphuric acid.....	0.50	0.37
Phosphoric acid.....	0.40	1.70
Chlorine.....	1.10	0.30
	11.77	35.18

Now, having before us the names of the several mineral elements which are found in the ash of the apple and pear wood, and of the grain and straw of wheat, noting

the proportion of the minerals in each, and knowing that these are the actual elements derived from the soil where the trees and the wheat grew, and being satisfied that wherever these fruit trees or the cereals grow they will constantly contain the same elements in almost exactly the same proportions, we come to the vital questions: Do our soils contain all these elements? and if so, in what proportions?

Of course this question can only be accurately answered by having a careful analysis made of the soil in each locality, and this cannot at present be obtained, for in our young State, as yet the men capable of doing this class of work are few, and each is constantly employed with his classes in our university, colleges, and higher institutions of learning. Still, an approximate and probably correct answer may be secured by a large portion of our practical fruit-growers, by noting facts and circumstances within the range of their daily observation, while engaged in horticultural pursuits, and by a series of experiments which tend to show what will increase the fertility or develop the capabilities of their soils. As a basis for such observations and experiments, we should know definitely what are the constituents of a soil, proven by actual use to be highly fertile and productive. Hence I copy from one of the illustrious Sprengel's trustworthy tables an analysis of a soil in the Ohio valley—soil and subsoil, for the latter must not be neglected—which yielded remarkably heavy crops of corn for several successive years, and doubtless would have been excellent for fruit-growing:

ANALYSIS OF AN OHIO VALLEY SOIL.

<i>Elements.</i>	<i>Soil.</i>	<i>Subsoil.</i>
Silica and fine sand.....	87.143	94.261
Alumina.....	5.686	1.576
Oxides of iron.....	2.220	2.536
Oxide of magnesia.....	0.560	1.200
Lime.....	0.564	0.243
Magnesia.....	0.312	0.310
Potash, combined with silica.....	0.120	} 0.240
Soda, combined with silica.....	0.025	
Phosphoric acid, with lime, etc.....	0.060	Trace.
Sulphuric acid, with gypsum.....	0.027	0.034
Chlorine, in common salt.....	0.036	Trace.
Carbonic acid, with lime.....	0.080	.....
Humic acid.....	1.304	.....
Insoluble humus.....	1.072	.....
Organic substances containing nitrogen.....	1.011	.....
	100.000	100.000

In the foregoing, what instantly strikes attention is the very large portion of sand—almost nine-tenths of the whole, and that while alumina, or clay, takes second place, it is but little more than one-twentieth of the combination. This would indicate to anyone who has given the examination of soils even slight attention, a very sandy soil; but when we remember that what is termed pure clay, or potter's clay (kaolin), contains from 40 to 48 per cent of silica, we at once perceive that all our soils contain a much larger portion of sand or silicious matter than they are commonly supposed to; and that the soil of the Ohio valley really contained no more of this important element of fertility than the soils of the Arkansas valley—yea, less than that of the farms near the river. Hence, without an analysis, we may safely conclude that any of our Kansas soils in which we readily detect a considerable portion of sand, probably contain enough of this element for ordinary farm and fruit-growing purposes. But, says an inquirer, how are we to tell whether or not our soils contain lime, magnesia and soda, which your table shows are among the essential elements of a fertile or fruit-producing soil? I answer, by a simple experiment.

These alkalies render water what is termed "hard." If a portion of your soil is leached, as our mothers and grandmothers leached ashes, to obtain the lye, with which they made the good, old-fashioned soap of our boyhood days, and the water which has passed through the soil is "hard," you have proof that the soil contains lime and probably the other alkalies. If in making the experiment, you use rain-water, which contains no alkali, and by the filtration it becomes in any degree less "soft," the presence of the alkali is proven. The water in wells of ordinary depth is usually an index to the character of the soil of the locality, for unless it is supplied from some underground stream, it is but the rain-water which fell on the surface, and for weeks and months has been passing through the soil and subsoil, in which period it has become impregnated with the mineral elements they contain. Again, if from the water of your well, your tea-kettle gradually acquires an inside coating, you may know the water you use contains alkaline properties, and that your soil probably has sufficient for the supply of your trees and shrubs. If the water obtained by leaching or in wells is in the slightest degree brackish, or from it the slightest amount of salt can be obtained, you have proof that your soil contains all the chlorine necessary to fertility, for common salt is but the combination of chlorine and soda; in chemistry called chloride of sodium.

Again, the presence of calcareous rocks in the neighborhood or in small particles commingled in the soil or subsoil, the presence of gypsum in the hills to the westward, or in strata beneath the soil in your neighborhood, indicates not only the presence of lime, but in the latter case of sulphur also, for gypsum (sulphur combined with lime) is sulphate of lime. Great complaint is made, especially in some portions of our State, that the water is alkaline, not fit to drink, etc., and while in rare instances we find it is a fact, the talk is generally made by some "ne'er do well," on the way eastward to live upon his "wife's relations;" and in localities where this peculiar taste of the water was common when the first settlement was made, I am informed it has, as the larger portion of the surface is brought into cultivation, gradually disappeared.

It will be noticed that the metallic oxides (of iron and manganese) are essentials of a fertile soil, and as these give to soils a reddish-yellow cast, like iron-rust, their presence is at once detected. They give the color to the red sandstones, and to a large portion of the loess in all our soils, which has come from the higher regions to the northwestward. By diverse means, then, within the reach of all intelligent soil-workers, the essential ingredients of a soil suitable for orchard or garden may be discovered, without the labor and expense of a careful chemical analysis.

What I would specially impress upon my hearers at this time is briefly this: That having before you, as I have above set forth, the exact mineral ingredients of the wood of the trees and plants you as horticulturists desire to cultivate successfully, and knowing that these mineral ingredients must be derived from the soil, it is a matter of the first importance to ascertain if the same ingredients are contained in the soil of your orchard and garden, so that, if any single ingredient is lacking, you may know what fertilizer or manure to use to supply the deficiency. While actual trial of the soil is no doubt the surest and safest proof of its capabilities, it is surely a matter of especial interest to those who have not yet selected the sites for their orchards to be able from close observation to determine what locations are preferable. In the broad Arkansas valley, and especially the higher lands adjacent to it, one can scarcely go or choose amiss, and where the reddish-brown subsoil appears as it does over a broad range of this portion of the State, we may expect in the near future to see large and very productive orchards and fruit gardens, which will be the especial pride and delight of skillful horticulturists.

DISCUSSION ON MULCHING THE STRAWBERRY.

HARVEY FENTON: Is stable manure suitable for such purpose?

MR. CHUBBUCK, St. Louis, Mo.: The foul smell likely to become an element of such material is its objection. In the absence of other material, would recommend corn stalks.

J. B. SCHLICHTER, Sterling: Why mulch? I hardly believe it to be necessary as a winter protection.

J. W. ROBISON, Towanda: Corn stalks have come into general use for such purpose in southern Illinois, but are chopped into short pieces before spread on the plants.

J. F. MARTIN, Winfield: It is not safe to use fresh stable manure, owing to the tendency to heat and weed seed it is likely to contain. I consider mulching an absolute necessity in the winter, to prevent the injury of alternate freezing and thawing, and would nearly cover the plants.

H. C. ST. CLAIRE, Belle Plaine: Last fall I mulched, and all such plants passed the winter in good condition, while those not so protected died. I would keep the mulch on through the season. Leaves of all kinds form an excellent mulch.

J. W. ROBISON: Oats should never be sown on a strawberry bed for the purpose of growing them for a mulch. They exhaust the soil and are injurious to the plants.

On motion, grapes and their preservation was next considered, and the discussion turned mainly on

SACKING OF THE FRUIT.

H. C. ST. CLAIRE: Grapes sacked are not only preserved on the vine, but will keep them into winter.

J. F. MARTIN: Grapes can be easily grown in Cowley county by anyone who will give them ordinary care. Paper sacks, when used to protect the fruit, will last for only one year, while cloth sacks will last for three years. They should be put on the fruit when about half grown.

G. W. BAILEY, Wellington: Planters are anxious to realize high prices for their product, and if sacking the fruit will be the means, then it should be adopted.

MR. CHUBBUCK: Sacking costs at the rate of about one cent per pound.

J. F. MARTIN: Paper sacks fail to protect the fruit from birds and unfavorable weather.

F. WELLHOUSE, Fairmount: Paper sacks, when dipped in paraffine, become water-tight.

J. W. ROBISON: Soaking the sacks in a solution of salicylic acid will destroy all infectious agencies.

WM. CUTTER: The Concord, Ives, Martha, and Dracut Amber grapes have been most profitable in Davis county. Moore's Early and Pocklington quite so; the Niagara is not.

On motion, discussion closed to listen to an essay on

FIFTY YEARS AMONG FRUITS.

BY A. G. COOK, WICHITA.

In reflecting upon our past history, we find many incidents in our early life more tried than those of a recent date, and this subject naturally presents itself in two different phases: First, the cultivation of fruit, as a business or for market purposes; second, their culture for home or family use.

The growing of fruits as a means of livelihood has, within the last few years, undergone such great changes and arrived at such a stage, that it becomes us to fully

and earnestly investigate, and collect all the best information relating to the best varieties for family use and for market purposes.

I do not purpose telling what to plant or how you should plant it, but would aver that a careful person may plant in the fall or in the spring until trees are out in leaf with perfect success, while a careless person will make a failure under the most favorable circumstances, either spring or fall. The writer has replanted trees when in full bloom, and they not only lived, but they matured their fruit the same season as well.

To review the history of fruit-growing as a business in this country, does not require us to go a great ways back. This industry may be said to have had its dawn within the memory of many who are now living. Up to a period dating back a half-century or more, and before the advent of steam transportation, the business of marketing fruits was quite insignificant compared with the present time. But it must not be supposed that there was not plenty of fruit at that time, and good fruit, too, before that time.

The planting of orchards, principally of apple and peach, received early attention from our first settlers, especially in the Northern States, and but few farms at that time were destitute—nearly a century ago, perhaps—and as a rule all fruit was obtained from seedlings. Then it was no trouble to grow apples, as the borer, codling moth, canker worm, or other pests, were unknown. And from this or some other unknown cause not understood, apples were an almost certain crop. These, when they could be sold, even at low prices, were hauled to market in sacks or loose in the wagon box, as they do potatoes, and the home market was supplied. As far back as my recollection can recall, seedlings were planted in an orchard; then, after they commenced to bear, the inferior varieties were grafted with grafts from the Newtown Pippin, Rhode Island Greening, Seek-no-Further, Holland Pippin, Newark Pippin, Early Harvest, Large Yellow Bough, and many other good varieties which succeeded well in the Northern and Eastern States. There are many new varieties which have originated since that time that are better adapted to the Southwest. The destruction of our fruit in this country by the codling moth calls for a concert of action on the part of all interested in the culture of fruits. There were not so many moths in the orchards this spring, consequently our fruit will be more fair, unless it is stung on the surface when partially grown.

In all cases the orchard should be a primary, and never a secondary matter, for the simple reason that the orchard pays 100 per cent. better than anything else on the farm. There are two methods of stamping out the codling moth: first, by spraying the trees with a solution of potash and Paris green as soon as the moths make their appearance in the spring, a course which will undoubtedly stamp them out in two or three applications. P. C. Lewis's spraying pumps cost but a trifle, and are worth twice the cost for other uses. For that matter, one of the pumps may serve several neighbors. A second method of destruction is, to punch holes in the ground with an iron bar and drop shelled corn in the holes, and set swine to work hunting for the corn. They will loosen the soil and destroy the worms, too. Yet by all means do not make a hog lot of a young orchard, but plan the work for them, and as soon as they have completed same, then turn them out. [NOTE.—The larva of the codling moth does not enter the ground. The method *may* be a good one for the destruction of the curculio family, which does descend into earth, to change into a perfect or beetle stage.—SEC'Y.] A gross porker will rub against a tree with tremendous force, thereby destroying the wood and bark of the tree, causing the bark to crack and curl, thus effectually ruining the tree.

Pears did not seem to have received much attention until a later period, and there

were but a few sorts, and those of poor quality. If we have not advanced very much in the apple culture, we certainly have to a remarkable degree with the pear. Peaches in western New York and Pennsylvania did very well for many years after the early settlement of that country; but after a few years they all died with the so-called "yellows." By-the-by, I would say that there is no such disease in the peach tree as the "yellows." It is simply starvation—nothing else but utter starvation.

The peach requires more pruning than any other fruit tree, yet they get less. After a protracted drouth in the latter part of summer and fall, there should be at least one-fourth of the top taken off as near the trunk as possible, thus preventing a lack of vitality in the spring, the neglect of which causes the so-called "yellows" to appear. Another important point in peach culture is: Take the earth away from about the trunk and pour scalding-hot suds therein, then apply a sprinkling of air-slacked lime or wooden ashes, and fill up the trench again around the tree. This is the quickest and best method of destroying the grubs which appear underneath the bark.

Cherries all did splendidly, especially the fine old varieties of sweet cherries, as the curculio had not then put in its appearance.

Plums also did well, and it seems to me that we had several varieties superior to anything we now have. Small fruits, except wild ones, had scarcely been thought of as a market crop, and now there is scarcely an industry that can be named that has made the rapid stride or progress as that of small-fruit growing for marketing purposes. Within the past twenty-five years the number of cultivated varieties of strawberries and grapes has multiplied an hundred fold; and blackberries, then unknown as a cultivated crop, are now grown by the thousands of acres.

It would be an endless task to go over all of these fruits and give a history of the many changes that have taken place in their cultivation, the improved varieties that have succeeded each other, the increased facilities for marketing the crop, etc. Thousands of acres are now used for the cultivation of fruits alone, and more are being planted.

We know traditionally, and from recollection of boyhood days, how fifty or sixty years ago that apples grew and flourished without any special care and yielded abundant crops. But there came a change. Apples became so abundant and cheap as not to be worth gathering and hauling to the market. To make them into cider or vinegar paid no better, and so orchards became neglected. Few young ones were planted. At this juncture apple-tree borers put in their appearance, and then, as if to seal their doom, came the codling moth. So it came about in a very few years that apples, from being so abundant as to cause a nuisance to the producer, now became quite scarce. The old varieties that had produced such abundant crops of large fruit couldn't be coaxed into bearing another crop, on account of utter neglect, and the business of transporting fruits to market for hundreds and thousands of miles not having been thought of, fruit-growing became practically of but little value. Soon after the depression referred to put in its manifesto, then apples came into good demand, and farmers once more turned their attention to the orchard. Just about this time the tree peddler put in his appearance, and of course did a thriving business. The apple-tree grafter also did a thriving "biz," for which the farmers in many instances sorely regretted. Grafting upon old half-dead trees was a loss of time and money at best, while the worst of it was the grafters were generally very unscrupulous cheats, and palmed off worthless varieties, as is often the case now-a-days with the average tree-peddler.

Kansas is a natural fruit-growing country, and has been settled mostly by enterprising people, who are ready to strain their purse, and credit, too, to get the best

varieties of fruit trees. Hence their susceptibility of being easily imposed upon by oily-tongued tree venders, who almost invariably wheedle them into their baited swindling traps. When the vender told us that his nursery was the only one in this broad land that had ever propagated the varieties in question, etc., why, it seemed rather a knock-down argument, and the order was filled at once.

When the trees arrived that were ordered we found that they were not as represented. We demur and plead for restitution, but all in vain. Their shrewd gotten-up order proves to be a note as soon as the trees are delivered, and there is no alternative but to pay the penalty for allowing ourselves to be deceived. We need to be thankful that the Legislature has passed a law, the import of which is to punish such swindlers. We would advise the patronizing of nurseries at home, or order direct from them. Plant varieties that have been tested in this climate and soil, and plant with care, cultivating thoroughly. Never sow oats or rye in a young orchard, for they are too exhausting. Plant corn or potatoes, taking care to keep the soil loose and mellow about the trees, if it has to be spaded in order to do so. Head the trees low, and be careful to keep them well balanced, in order to protect the trunk from sun-scald, which causes premature decay, and certain death to the tree. An apple orchard should never be planted closer than thirty feet each way; thirty-five feet would be a better distance. Peach trees may be planted north and south, between the apple-tree rows, and as their space is required, grub them up. Planting an orchard too close can't be remedied as easily as putting too many grains of corn to a hill. Therefore, be careful and not make the mistake of planting apple trees too close together.

The facilities of transportation by railway, which have grown up of late years, furnish a demand for fruits of all kinds in all parts of the civilized world, so much so that the country where all kinds of fruits can be raised successfully should be utilized in that way, as the profits of fruit-raising are greater by far than common farming. An orchard of a good selection, well cared for, will pay the interest of \$2,000 per acre, one year with another, for twenty years after it comes into full bearing. It will pay the farmer to give that part of the farm his special attention. However, they don't do it, and, as a rule, the orchard is the most neglected, being allowed or expected to take care of itself.

In order to receive the best results in fruit-growing in Kansas soil, it should be subsoiled to twelve or fourteen inches in depth before planting. No doubt but what this method will prevent the premature dropping-off of fruit, in times of a protracted dry season, in a great measure. Proper distance and thorough cultivation hold good with the orchard as well as with the corn field. Various crops have been recommended for the orchard. We are fully convinced that it is all wrong. Give the fruit the full benefit of all of the soil, and with a mixture of well-rotted compost and ashes or lime, every other year after it comes into bearing, it will doubly pay for the extra care and cultivation. Insect pests, which are so troublesome in orchards, may be stamped out in a short time by the use of one of Lewis's spraying pumps, using a strong solution of soapsuds with one teaspoonful of Paris green to a pail of the suds. London purple may be used, but Paris green is preferable, for the reason it will dissolve and not clog the spraying tubes or apertures.

With the present high prices of fruits of all kinds, the increasing demand proves very clearly that there is no other branch of farm industry half so flatteringly profitable as horticulture if properly conducted. To such an extent is this now carried, with every remote part of the country under our reach, and the cost of transportation so trifling, a thing not enjoyed by the fruit-grower of forty or fifty years ago, the fruit culturist has the whole civilized world for a market, and each competitor is, seemingly, brought within a radius of a few miles of all the others.

Is the situation such as to enable us, with all the light we have on the subject, and with a given soil and climate, to compete in this business with any and all parts of the globe and in our own market? Most truly we can.

J. L. WILLIAMS, Oswego: The essay says Paris green is preferred to London purple because it dissolves in water and London purple will not. This is contrary to my experience.

F. WELLHOUSE, Fairmount: London purple is preferred because so much cheaper, and is effectual. Either are valuable only as destroyers of leaf-eating insects, and in proportion to the amount of arsenic they contain. London purple can be bought by one hundred pounds at nine cents per pound. It should be dampened in bulk to prevent its flying about when mixing with water for use.

J. E. WHITE, Kent: Experience has proven that a teaspoonful of Paris green to a pail of water is sufficient to destroy the potato beetle.

J. W. ROBISON: The canker worm is spread into a region either by the dirt containing the larva adhering to the roots, or by the deposit of eggs on trees moved in the spring. [NOTE.—Or moved in autumn.—Sno'r.] Hence the precaution should be taken to avoid such trees as are grown in the vicinity where they are known to be present.

On motion, the discussion of the essay closed, and was followed with

REMARKS ON FORESTRY.

J. F. MARTIN, Winfield: I feel a deep concern in the efforts being made by the settlers on our western plains. Civilization cannot exist in any country without the beneficial aid of forests. The continued and wonderful rapidity of the destruction of the natural forests of this continent must in due time bring great disaster to the Nation, and is an occasion for alarm. We are now engaged in efforts of an opposite character, viz.: Not only the re-forestation of the wasted districts, but also to extend the area of forests into the treeless regions of the West. Those settlers, fully recognizing the benefits to be derived, are closely and earnestly applying themselves to a work of experimentation to determine the most valuable kinds which will adapt themselves to the plains. It is claimed by some that the Russian mulberry is the tree, while others will assert that the catalpa, or black walnut, or black locust, or honey locust, or ailantus, is the most suitable. Probably all of these will prove valuable.

J. B. SCHLICHTER: I believe the honey locust has the preference. At Speareville, one of the most trying stations on the line of the A. T. & S. F. Railroad, this tree is the most hardy, and made the most vigorous growth of any in quite a number originally planted there. The wild cherry succeeds in Rice county. Black locust has attained to a good size, and is free from the damaging borer.

G. W. BAILEY, Wellington: I have the wild cherry now seven years old from the seed, which measure six to seven inches in diameter. The ailantus will thrive in most places, and stock will not molest it.

H. C. ST. CLAIR, Belle Plaine: I planted the ailantus several years ago; they grew very rapidly and killed to the ground the first year, and partially the second year. I have them now which will measure eight inches in diameter, and their wood is solid and heavy.

Discussion closed, and on motion the meeting adjourned until 8 o'clock p. m.

EVENING SESSION.

WEDNESDAY, June 30, 1886.

President Johnson in the chair. The committee on appropriate emblems or tokens of respect for deceased members, submitted the following

REPORT.

Your committee would suggest that crape be worn by members, on the left arm, during the session of the next annual meeting, as a token of respect and high esteem for the deceased members, Acting President M. B. Newman; Dr. Charles Reynolds, a life member; and J. D. Manlove, for many years the Society's Vice President for Bourbon county; and as an additional mark of respect for President M. B. Newman, that the President's stand be draped during the annual meeting. And your committee would further suggest, that this manner of showing respect for deceased members become a rule for the government of the Society in all future cases of deceased members, until otherwise ordered by the Society.

Respectfully submitted.

E. J. HOLMAN,
For the Committee.

On motion, the report was adopted, and the committee were requested to provide the necessary number of such tokens for use of the Society at its next annual meeting.

REPORT OF COMMITTEE ON FRUITS EXHIBITED DURING THE MEETING.

Your committee find on exhibition the following fruit:

By M. R. MOSIER, Wichita: Apples, product of 1885, in good condition; Ben Davis, Rawle's Genet, York Imperial, and a seedling resembling the Ben Davis in all respects, except its color, which, being a bright red, is an improvement on that variety.

By H. B. HART, Fort Scott: Raspberry, Gregg and Shaffer; blackberry, Kittatinny and Snyder. All excellent samples in size and quality.

By W. H. CURREY, Gordon: Houghton gooseberry.

By J. L. WILLIAMS, Oswego: Apples, Carolina [Red] June, Sops of Wine, Red Astrachan, [Duchess of] Oldenburg, Early Harvest; pears, Summer Doyenne, Clapp's Favorite; plums, Wild Goose.

By H. C. ST. CLAIR, Belle Plaine: Pear, Clapp's Favorite.

By JACOB NIXON, Kellogg: Apples, Yellow Bellflower, Red Astrachan, and an unknown variety.

By ROSE & MUEHLER, Wichita: A fine display of healthy, vigorous green-house plants.

Respectfully submitted.

E. J. HOLMAN,
For the Committee.

On motion, the report was adopted.

[NOTE.—The apple exhibited by Mr. Mosier as a seedling was pronounced by Major F. Holsinger to be the "Gano."—Sec'y.]

RESOLUTIONS ON THE RESIGNATION OF PRESIDENT E. GALE,

OFFERED BY L. A. SIMMONS, WELLINGTON.

Resolved, That this Society, in accepting the resignation of President E. Gale, who has for many years been its efficient officer, does hereby express its sincere regrets that the pressure of life's urgent affairs has taken him from our midst, and which, in his judgment, necessitates his resignation. Therefore, we do hereby express our sincere thanks for his many kind and noble deeds, and the well-directed zeal which has always characterized his administration of the Society's affairs while in-

trusted to his care; that, while holding in firm remembrance his eminent services as our honored President, we will ever warmly cherish the high personal regard we entertain for him, and wish him the best of health and highest degree of prosperity and happiness in his new home.

L. A. SIMMONS, *Committee.*

On motion, the resolutions were unanimously adopted, and the Secretary instructed to transmit an authentic copy to Prof. E. Gale.

The President announced as next in order the reading of the

PRESIDENT'S SEMI-ANNUAL ADDRESS.

[NOTE.—This address had been prepared by the Acting President, M. B. Newman, prior to an attack of the disease which subsequently caused his death, before the assembling of the Society in its semi-annual meeting.—SEC'Y.]

Members of the Kansas State Horticultural Society: Again we have convened to deliberate upon the interests, the progress, and the prospective possibilities of horticultural enterprise in Kansas. This implies, or at least should imply, that we have come prepared to consider all that may come before us carefully and intelligently, and that some of us have come with somewhat improved understanding of the subject.

Horticulture, like every other leading pursuit of life, is a matter of progressive unfoldment—or of evolution, if you prefer the term. Hence, if we have assembled here without any of us being possessed of any advanced understanding of the subjects of our deliberations, we might better have saved the time and expense of our meeting and left it to our already-published reports to tell the world all we actually know of horticulture.

But judging of the present, and of the future by the experiences of the past, I am far from apprehending any failure at this session of advancing our horticultural industry in Kansas, not only as to its practical operations, but also in regard to the scientific principles involved. From our first experimental groping through the mists of almost wholly untended conditions, up to the very creditable and instructive digests of our entire past (publication now in preparation), we find that continuing accumulations of our horticultural knowledge have annually proven an ample recompense for the time, labor and expense involved in the acquisition.

What we have already realized leaves no room for doubting the existence in our State of all the leading conditions of horticultural success. Yet, in the fuller development of these conditions, there is continuing need of patient, persevering and intelligent observation and labor. Great ends are only attainable by corresponding efforts; and the purposes of this Society constitute no exception to the general rule. The successful merchants are those who scan the productive industries of every region within the scope of their commercial transactions; who clearly consider the facilities of transportation from regions of surplus to those of insufficiency of products; who further take into account the financial condition of each region, and thus determine the comparative advantages as to where to buy and whence to transport their purchases for disposal.

Similarly, these elements of success largely affect the operations of all our leading manufacturing enterprises, and even the scheming politician must keep ever on the alert to detect as clearly as possible the trend of popular feeling on the leading political issues of the times, as well as the popular fancies and whims, and trim his sails to catch all the special influences that promise aid in his insatiate ambition for place and power.

But without at all placing ourselves on the low plane of the majority of actors in this last illustrative case, we can fully comprehend that success in any of the leading pursuits of life must depend upon the intelligence with which we observe, and the

clearness of our judgments on all of the factors of success or failure pertaining to our ends in view, as well in horticulture and agriculture as in any other calling.

It is true that where the conditions of environment are subject to little or no changes, it is possible to achieve success through mere stolid following of beaten paths; but here in this rustling, energetic and rapidly-progressing State of Kansas there is no such thing as stagnation of conditions. Here the magician's wand is ever on the move. New settlements and new cities are rapidly developing everywhere around us, and new railroad lines are stretching out in every direction; and thus every year more than doubling the demand and markets for horticultural products. Correspondingly new competitors are crowding in amongst us to aid in supplying this increasing demand.

In this active competition, intelligence, energy and thoroughness must be the reliable factors of success. Those who mope or lag behind are distanced in the race, and pushed off the course. But above and beyond its mere pecuniary rewards, there is a spirit developed in horticultural pursuits that elevates its votaries to aspirations of a higher order. Of this spirit one of the prominent manifestations is the fraternal feeling with which fruit-growers regard each other. It is this feeling that induces them to congregate in local and State societies and benefit each other with reports of their experiences and observations, the discussion of which inure to the advantage of all who give earnest attention thereto. And even beyond this; such is our love for the meritorious calling in which we are engaged, that we delightedly welcome every new discovery and every new improvement that adds to the variety, the quantity or the quality of the beneficent product of our industries.

Such are the feelings with which we assemble from time to time in our regular sessions, and under such influences we undertake the discussion of the varied topics presented through the reports of our regular committees, or incidentally by our closely-observing members. To these committees we naturally look for a careful presentation—by each in its own special field—of all new ideas and discoveries emanating from creditable sources, and accompanied with the evidences, *pro* and *con*, as to their practical reliability and value. The full discharge of such duties by our various standing committees should present to us, at each session, a most interesting mass of material for profitable discussion.

Here allow me to suggestively inquire whether our committees have been giving that attention to the important matters assigned to each that will enable us to heartily thank them for the thoroughness of their work? Have they kept themselves diligently on the lookout for new ideas, new discoveries and new improvements in the various branches of horticulture pertaining to their respectively allotted fields? Do they keep convenient memorandum books, and jot down, "in season and out of season," items which seem to be worthy of special mention in their reports?

In response to these questions, I am happy to answer for several of the committees that they have, to a considerable degree, discharged their duties very creditably; and I hope that all their reports to this session may afford assurance that they each appreciate the importance of their respective duties.

By the way, how is it that we have no standing committee on experimental horticulture? Such a committee as this in Kansas, as in all other regions presenting untested conditions of local environment, should be considered as indispensably important. And to such committee might also be referred the matter of new fruits, and especially of local seedling fruits.

As the importance of thoroughness in our deliberations cannot be too strongly urged, I feel disposed to suggest a separation of our subjects of discussion—assigning certain portions to our summer or semi-annual sessions, and the others to our annual sessions. That is, that at our semi-annual meetings we limit our transactions

to discussions pertaining to the small fruits, floriculture, landscape-gardening and kindred topics, and devote the annual sessions to orcharding, forestry and allied subjects. If such a division of our labors could be satisfactorily arranged it would unquestionably afford more ample time for the discussion of each, and thereby give better opportunity for thoroughness in such discussion.

But to secure the most satisfactory results from our deliberations, it is indispensably requisite that we more thoroughly qualify ourselves for the discussion of the various subjects connected with horticultural progress, by a close and more general study of the scientific elements necessarily involved. A man might as well undertake to read the mysteries of the starry heavens without instructions in the principles of astronomy, as to try to discuss all the questions arising in horticultural pursuits while ignorant of the elements of agricultural chemistry and vegetable physiology. True, the man who is not a scientist may learn, and learn well, the routine operations of practical horticulture, and achieve satisfactory success thereby; but when his mind is led to the investigation of the reasons of unexpected successes or failures, or of the many interesting phenomena so frequently attracting attention in horticultural work, he meets with difficulties which can only be surmounted by scientific explanation. For instance, a man of no scientific knowledge while plowing in his young orchard carelessly wounds with his whiffletrees a portion of the trees.

The next year he observes that the trees thus injured blossom and bear fruit, while the others simply continue their wood growth. His simple inference would be that a like treatment of all the trees would be attended with like results; the plan is adopted, and general fruitfulness the next year verifies his predictions. But sooner or later he is confronted with the astounding fact that the wounding of his trees, and the further debilitation resulting from their premature production of crops of fruit, have destroyed the constitutional vigor of his entire orchard, and that his trees have become wholly worthless at the age at which they would naturally have been just entering their prime.

This simply illustrates the effect of the too-common barbarism of boring holes or driving rusty spikes into the bodies of young trees to hasten a premature productiveness. Vegetable biology clearly explains that whatever checks exuberant growth has a tendency to promote fructification. But the experiment is carried far enough when we dig a trench, in early summer, around the tree, of a radius fully equal to the expansion of its limbs, cutting off all the rootlets extending so far out, and thus doing but little material injury to the vitality of the tree. Yet even this experiment should be limited to such varieties as the Northern Spy, Pryor's Red, and the like, which too provokingly delay their period of bearing. All of the earlier bearing varieties had better be left till nature has fully prepared them for the debilitating strain of crop-production. Science and observation alike teach that in the long run this is the better course.

Thus it is that with almost every phrase of horticultural work; science is found to be the indispensable accompaniment of labor. And with the astonishing results of modern enterprise it may well be doubted whether in a few years more the practical fruit-grower can any more dispense with a scientific education than can our physicians or civil engineers. Where competition becomes most active, every useful factor must be fully at command to insure success. Therefore so important a factor as science cannot much longer be dispensed with, even by the common laborers in horticultural employment, much less the managing operators.

Another reason why our Society should foster a higher intelligence among the fruit-growers of our State is the protection they require from the gross impositions now so skillfully practiced upon them by the silver-tongued itinerants, who are

ceaselessly prowling for victims among the simple-minded and ignorant. These rascals are no sooner exposed in one class of frauds, or in any one locality, than with the adroitness of a mountebank they appear in another role, or in another locality, to fleece new victims by their audacity and impudence. Some of these rascals claim to have insecticides of miraculous and never-failing virtues; some profess to have seeds of new and unheard-of varieties of fruits and garden vegetables; others again solicit orders for wonderful and new varieties of our orchard and garden fruits, capable of resisting the vicissitudes of all manner of adverse climatic influences. All have their bogus illustrations of the unapproachable attractions of their wares; some in bottles that magnify the inclosed specimens in two-fold proportions, or with gaudy fruits of absurd size and preposterous coloring. Ingeniously adapting the pomological device of the devil in the temptation of our simple-minded mother Eve, they first attempt to capture the woman of the household with their deceptive prints and stories, and, thus reinforced, turn the assault on the devoted *pater familias* with unbounded assurance of a big order.

All honor to the honest agents of well-known, reliable nurserymen, who diligently seek to supply our wants with actual good things and at fair prices; and all credit to our fruit-growers that readily improve all opportunities for purchasing and testing those things that are reliably shown to be best adapted to our actual requirements in Kansas. But as to those itinerant frauds we can only say: "Oh, to put in every honest hand a whip, to lash the rascals naked through the world."

In conclusion, let me call attention to the interesting fact that our labors in this Society are not only for the Kansas of to-day, but for the aspiring, vigorous and progressive Kansas that is rapidly looming up into colossal proportions, soon to become the central star in the galaxy of our national Union. A State which, in addition to its great commercial emporium now astonishing the world by the rapidity of its growth on our eastern border, has, also, within but little more than one decade developed away down here at Wichita, nearly two hundred miles southwest from our State capital, a giant young city of over 20,000 inhabitants, and which any trans-Mississippi State would be proud to boast of as the development of half a century within their less progressive borders.

Then let the hope and energy by which we are surrounded here spur us up to a full appreciation of the demands resting upon us, and enable us in all that is said and done at this session to score to the mark and hew to the line of highest horticultural intelligence.

COMMITTEE ON PRESIDENT'S ADDRESS.

On motion, the address was placed in charge of the following committee, who were requested to report thereon at the next annual meeting: L. A. Simmons, E. P. Diehl, Chas. Williamson.

Next in order upon the program was an essay on

FLOWERING PLANTS AND SHRUBS: THEIR ARRANGEMENT AND MANAGEMENT IN DOORYARDS.

BY ROBERT MILLIKEN, EMPORIA.

The distinctive features which mark the home of the educated and refined resident of a place, and distinguish it from the hovel of the ignorant, brutal denizen, are flowering plants, shrubs and trees.

It is my object to offer in this paper a few practical suggestions upon the selection of a few of the more accessible and easily cultivated plants and shrubs, adapted to the particular wants of the people of Kansas, many of whom are unable to invest in costly and untried kinds. Seventeen years' experience and observation combined enable me to speak with some degree of confidence on this subject.

In the treatment of this subject it is important to know at the outset what kind of a place is to be improved; whether a large lawn, or but a small yard of mixed shrubbery and flower beds, and in what manner the place is to be laid out. I will, however, assume that the majority for whom I write this wish to plant a small lawn or yard in front of or about the ordinary dwellings, and the plants and shrubs to be used should be of the easiest culture. There are certain general qualities that will apply to all plants and shrubs to make them desirable. The most essential is easy culture, sufficiently luxuriant foliage to cover the plant and give it a neat and complete form, and the flowers be conspicuous, of good colors, and possess a desirable fragrance.

I will first direct attention to the number and variety of plants commonly known as bedding plants. Of geraniums, verbenas, coleus, alternantheras, carnations, pansies, chrysanthemums, lantanas, petunias, and others too numerous to mention, there are thousands, and the methods of arranging and managing are as varied as the tastes and means of the planters. Only one rule is necessary to be observed, and that is, "get good plants, set them in well-prepared, rich soil, and keep them well cultivated," and success will crown your efforts. In addition to the above there are many bulbs and roots of a tropical and half-hardy nature which are very desirable and worthy of recommendation.

Foremost in the list I will place the gladiolus. The roots may be planted as early in the spring as early potatoes, and to prolong the season of bloom, at intervals until June, they require little care, except to keep the ground clear of weeds, and tie up the flower-stalks to stakes to keep them from being blown down by the wind. In the fall lift the combs and store out of the reach of frost, anywhere that will keep potatoes, and next year repeat the operation. The gladiolus will give more real pleasure and satisfaction for the money and labor, than any other plant with which I am acquainted. A flower-stem cut when the first flowers have expanded and placed in a vase of water, will continue to expand until the last bud has opened.

The tuberose next deserves attention, on account of its most powerful and delicious fragrance. There are four varieties, two double and two single. The common double Italian grows three to four feet high, and is well known. The Pearl is but two to three feet high, and has its somewhat larger flowers more closely arranged on the stalk. The latter is the favorite with amateurs, but the common is the favorite with florists, as it opens its flowers more fully and blooms more freely. The single variety is used by florists chiefly for forcing, as it blooms a month or more earlier than the double. The fourth kind is valued and grown for its striped foliage chiefly. They should not be planted until the ground is well warmed in the spring, as this plant requires a good deal of heat at all times. The roots are difficult to keep through the cold weather. The temperature of a common cellar is almost always fatal to the flowering qualities of a tuberose bulb. A bulb blooms but once, and a temperature approaching the freezing point is very apt to destroy the bud or germ of the bulb, and a mass of leaves is all it will produce. All small bulbs and offsets should be removed at time of planting, to allow the entire strength of the bulb to go to the perfection of the flower stalk. The offsets thus removed may be planted and grown to increase the future stock of flowering roots.

The tigridia is another bulb of easy culture, requiring nearly the same treatment as the tuberose, but not quite so sensitive to cold. It differs, however, in blooming from the same bulb from year to year.

Dahlias are too well known to require any further notice. I have succeeded well with them.

Cannas, caladiums, amaryllus and others I might name, make quite an extensive assortment.

All the bulbs named except the *amaryllus* and *tigridia* must not be allowed to suffer, at any stage of their growth, for want of water. Give them liberal doses of good rich manure, and in dry weather a bucket of water every evening, and you will be well repaid for the extra effort.

Hardy herbaceous plants have always been and always will be popular. The lily is of first importance. Everybody knows the old tiger lily, and the beautiful, sweet, old-fashioned white or Easter lily, both of which are of the easiest culture. One fact not generally known is, that the white lily completes its growth during the fall months, and blooms in the spring, hence should only be transplanted in July or August. Persons fail with this lily when they set it in the spring. The Japan lilies, more particularly the *speciosum* class, are almost always successful, either set in spring or fall. The *lilium auratum*, or gold-banded lily of Japan, the *longiflorum*, and several others of the Japan class, are reasonably satisfactory. Of recent introduction, the *tenifolium* and *Harrisii* are now the rage. The latter I do not think is hardy enough to withstand our winters out of doors.

There is a large class of plants, not lilies, but popularly known as such, nearly all of which are hardy and worthy of general planting. The most common are the *hemorocallis* or corn lily, and the lemon lily; the *funkias* plantain, or day lilies, white and blue, blackberry lily, and a number of others.

After lilies the perennial phloxes, peonies, larkspurs, columbines, pinks, hollyhocks, etc., etc., all of which are perfectly hardy, and have to be planted but once to gladden the heart and please the eye of the grower for years to come. Not partial as to soil or exposure, only needing to be kept free from weeds, no other class of plants will give a better return for the labor bestowed on them than hardy, perennial plants.

There are a number of grasses, perennials, and in their requirements much the same as the preceding class, which, in the hands of the skillful planter, are capable of charming effects. The *eulalias*, *Japonica variegata*, and *Japonica zebrina*, the first striped much in the style of our grandmother's old-fashioned puzzle, or ribbon grass, and the other striped horizontally, are decided acquisitions. Plume grass is a very good substitute for the fine pampas grass, which unfortunately is not hardy with us. Then there are the several reeds and bamboos, many of them beautifully striped and variegated, which make quite conspicuous objects in appropriate positions in the yard and on the lawn. All the grasses require very rich ground and plenty of water during the growing season. Don't forget the water.

A good plan with these and such plants as dahlias, *tritomas*, *caladiums*, and all plants requiring rich and liberal treatment, is to make a basin of 12 or 15 inches in diameter around the base of each plant, by scraping up the soil, and place three or four inches in depth of rich, half-rotted manure to further enlarge the basin, and every evening, in dry weather, pour a pailful of water into this basin. Your plants will astonish you with the luxuriant growth they will make.

For most of the plants heretofore named, good rich garden soil is all that is required for their growth; their care and culture are very simple.

Shrubs form a conspicuous feature of every landscape, hence in home decorations cannot be dispensed with. Shrubs are distinguished from trees by their smaller growth, and by their tendency in most cases to throw up many sprouts from the crown, near the surface of the ground.

For the embellishment of small places, more particularly city and village door-yards, the shrubs are of inestimable value. Many persons make the mistake of planting in a small place large trees, which soon become so large as to incumber the ground and overshadow everything else, when two or three choice shrubs would have been more in keeping with the requirements of the place and would have given

more real pleasure. How often do we see a huge Austrian or Scotch pine, or Norway spruce, or even a maple, or some other deciduous tree, which in a few years requires 30 to 50 feet of space for its development, put in a small yard with not over 12 or 15 feet of room for it. Disappointment and vexation are sure to be the result.

I have tested a large number of shrubs, and can with confidence recommend the following as perfectly hardy and reliable under all ordinary circumstances: Lilacs in variety, Tartarian honeysuckles, syringas (*Philadelphus*), viburnums, which will include the common snowball, the Japan (*V. plicatum*), and our two or three native sorts, deutzias, flowering almond, barberry, common and purple leaved, red and yellow flowering currants, common and California privet, Japan quince, and spireas in half a dozen varieties.

The following list are hardy under ordinary conditions, but often fail when circumstances of soil, exposure or season are unfavorable: Altheas, hydrangea paniculata grandiflora, forsythia viridissima, and suspensa, wigelia, and a few others of less importance.

The total failures are calycanthus, red-twigged dogwood, African tamarix, and some of the thorns on upland.

It is scarcely worth my while to consume time in reciting the distinctive merits of the different kinds in the first list, as I do not suppose there is a person within the sound of my voice who is not familiar with every one enumerated. Allow me to remark, however, regarding the mock orange, erroneously called syringa, that *Philadelphus coronarius* is the deliciously fragrant one, and the *P. grandiflora* the large late flowering variety. Many are disappointed in their plants when they expected the fragrant *coronarius* to find they have the scentless variety. Bear this in mind, and accept none but the *P. coronarius* if you want fragrant flowers.

The Japan snowball (*Viburnum plicatum*) is more beautiful and to be preferred to the common *viburnum opulus*, where a hedge is desired about a dooryard, and no other plant is so desirable as the privet. Easy of culture, naturally a shrub, it is easily kept within bounds without the great labor necessary with the Osage orange, and having the additional advantage of being nearly an evergreen, it leaves no thorns about the yard to prick the bare feet of children.

The second list needs some explanation. The altheas and the great panicle hydrangea, which, by the way is, when properly grown, one of the most beautiful of hardy shrubs, make their growth before flowering, and bloom during August and September, a time, as all old Kansans will tell you, in which we are not always sure of seasonable rains. If the weather is favorable, or care is taken to see that the plants do not want for moisture, all will be satisfactory; but if dry weather should occur, failure is almost sure to be the result. All shrubs which bloom late in the season on wood of the current season's growth should be cut back freely in the spring, while those blooming early should not be pruned until after flowering. The forsythia and wigelias are often winter-killed. The same dry, hot weather that causes the buds of the altheas and hydrangeas to fall prematurely, and that so fatally saps the vitality of our raspberries and blackberries in August and September, and causes them to be *winter-killed*, weakens the wigelias, and alas, when spring sets into motion the vital forces of nature, the beautiful flowers of the wigelia fail to appear. Careful watering during dry weather in the late summer and fall, will well repay the cultivator in the increased number of flowers in the spring. If there is no dry weather in fall there will be no winter-killing.

The calycanthus absolutely refuses to grow more than one year for our people, and no amount of nursing and coaxing will induce it to live except as a pot plant. While we have three or four dogwoods indigenous to the State, and of extreme hardiness, the most beautiful of the *comus* family, the great white-flowering dog-

wood (*Cornus florida*), will not, nor will its foreign relative, the red-twigged shrub, *C. sanguinea*, thrive.

Of evergreen shrubs and the smaller-sized varieties of our common evergreens, I think it is unnecessary for me to speak, as they hardly come within the scope of my subject. I have planted the yew—the dwarf, tree, and gold and silver box—many of the dwarf spruces, pines and arbor vitæ, but all have gone where the woodbine twineth.

Every little while some enterprising agent from away back in the States pounces down on our people with a stock of rhododendrons, and induces them to buy and plant them. Of course we “greenies” away out West here are not posted on the finer horticultural products, and it takes these oily-tongued chaps to enlighten us. The first year they start off and make a promising show, and behold! didn’t we tell you that you knew nothing about the finer trees and plants? See how they succeed in Kansas, in spite of your assertions to the contrary. But wait until the second year, when the smile will be from the other side of the mouth, as the fine promise of the first season is seldom sustained when the fine, tender fibrous roots are called upon to endure a trial of the hot, dry weather so often prevalent in this State, and which even taxes the endurance of the cottonwood, the elm, and the maple. Too much hot, dry wind, and too severe drying of our clayey soil in late summer, and they are “winter-killed.” The climate of Canada or New England, with minus degree of 30 or 40 of cold, does not appear to be prejudicial to their health or vitality, while the zero temperature of Kansas is fatal.

I am watching an investment of a couple of hundred dollars by one of our citizens in this direction. When I saw the beautiful plants, two to three feet high, set out in an open exposure on the highest ground in the city, in the full glare of the sun, I suggested a tent to give them the natural protection. “Oh,” say they, “Mr. E., of whom we bought them in Pennsylvania, assures us that they are perfectly hardy and will surely do well with us.” However, people must live and learn. Experience keeps a dear school, and fools will learn in no other. These few thoughts have not been penned for those who will learn only in the school of experience, but for those not so wise in their own conceit that they cannot take a hint.

I have not attempted to give a description of all the kinds that will succeed, or that may be planted with a reasonable hope of success, but to give a list of such as have been tried and found to succeed, with such hints and suggestions as my experience and observation have suggested to me. As the country gets older, and the wild nature of the prairie soil becomes subdued, and the shelter and protection of trees in groves, orchards and wind-breaks become more marked, many things can be successfully grown which in the newer condition of the country are next to impossible. Since I have lived in Kansas I have seen the truth of this statement verified in many things. Yet the safest rule is to hold fast to those things that we know are good, and plant the well-tested, well-known kinds, remembering the shrubs which are most commonly known, and the cheapest, are generally the finest, or at least have the greatest number of desirable qualities.

REMARKS ON THE SUBJECT OF THE ESSAY.

MAJ. HOLSINGER, Rosedale: I have no shrub which affords more satisfaction than the *calycanthus*. It can be grown successfully under the conditions required for currant bushes. It requires plenty of moisture. Of the roses, the *Comtesse de Murinais* is one of the finest sorts.

L. A. SIMMONS, Wellington: Climbing roses, wistaria and honeysuckles are all desirable for covering unsightly places.

- DR. CHAS. WILLIAMSON, Washington: Most of the hybrid perpetual class of roses are very beautiful. Their bloom may be increased and their season of flowering prolonged by enriching the land and removing the seed pods.

J. P. COX, Fredonia: I love the Sweetbrier rose at the window for its rich fragrance.

WM. CUTTER, Junction City: Let me urge those of you who are making new homes to plant the door-yards with shrubs and flowering plants at the beginning. They will succeed much better than when the shade trees become large and their roots invest the land.

FINAL RESOLUTIONS.

The Committee on Final Resolutions offered the following:

Resolved, That the members of the Kansas State Horticultural Society here convened, do hereby tender their sincere thanks—

1st. To the citizens of Wichita, for the kindness and very liberal hospitality shown them during the meeting.

2d. To the Sedgwick County Horticultural Society, for the ample provisions made for their comfortable entertainment.

3d. To the G. A. R., for the use of their beautiful and commodious hall in which the meeting has been held. And

4th. Especially to the Wichita Band, for the excellent music furnished during the evening sessions.

On motion, the resolutions were adopted, and the meeting adjourned *sine die*.

PROCEEDINGS OF THE TWENTIETH ANNUAL MEETING,

HELD AT

EMPORIA, LYON COUNTY, KANSAS,

TUESDAY, WEDNESDAY, AND THURSDAY, DECEMBER 7, 8. AND 9, 1886.

The Society assembled in the assembly room of the State Normal School, at 10 o'clock A. M., on December 7th. President Geo. Y. Johnson called the meeting to order, and Rev. Chas. H. Lovejoy opened the exercises with prayer.

The President, in a cordial manner, invited the attendants to accept the privileges of the floor in all discussions, whether members or not, and announced the following committees, which were requested to report during the meeting:

On Credentials—E. P. Diehl, Olathe; Jas. Sharpe, Parkerville; F. Wellhouse, Fairmount.

On Constitution—L. A. Simmons, Wellington; A. Willis, Ottawa; E. J. Holman, Leavenworth.

On Auditing—Samuel Reynolds, Lawrence; Geo. Olivant, Conway; J. S. Hastings, Emporia.

On Nominations—J. W. Byram, Cedar Point; F. Holsinger, Rosedale; Samuel Reynolds, Lawrence.

On Membership—F. Wellhouse, Fairmount; C. H. Lovejoy, Vinland; J. V. Randolph, Emporia.

On Obituary—L. A. Simmons, Wellington; Dr. Chas. Williamson, Washington; F. H. Holsinger, Rosedale.

Exhibited Products—E. J. Holman, Leavenworth; A. C. Griesa, Lawrence; A. Willis, Ottawa.

On Final Resolutions—Dr. Chas. Williamson, Washington; B. F. Smith, Lawrence; F. Holsinger, Rosedale.

On Program—Robt. Milliken, Emporia; Dr. Chas. Williamson, Washington; Wm. Cutter, Junction City.

The President announced a report of the Standing Committee on Orchards, on the following subject:

COSTS AND PROFITS OF AN APPLE ORCHARD.

BY F. WELLHOUSE, FAIRMOUNT.

In planting an orchard to supply the family with fruit, not much attention is usually paid to cost and profit; varieties are planted to suit the tastes. But when fruit is grown for market it is done for the money there is in it, and the first problem to be solved is, "Will it pay?" And to help settle this question the Committee on Orchards are asked to write out an estimate of cost and profit of an orchard, and in

doing so we feel the responsibility assumed. We know that some men will plant an orchard and make money out of it, and we also know that others do grow apples as well as other fruits, that cost them more than they get for them; and we are aware that in writing up an estimate of what we think an orchard ought to cost, and what the yield should be, we shall meet the expectations of but few, and undertake the task with reluctance, and would not have undertaken it at all but for the request of our Secretary.

As a basis for our estimate, we will take a block of 1,000 apple trees, covering ten acres of ground.

EXPENDITURES AND RECEIPTS.

	Expenses.	Receipts.
FIRST YEAR.		
To preparing ground by plowing twice.....	\$30 00	
To preparing ground by harrowing twice.....	6 00	
To furrowing the ground for rows.....	3 00	
To cross-marking furrows to indicate the place to plant.....	1 00	
To cost of 1,000 trees, at \$10 per 100.....	100 00	
To cost of planting 1,000 trees.....	15 00	
To planting land, between rows, to corn.....	4 00	
To season's care and cultivating—corn and trees.....	25 00	
To gathering crop of corn—300 bushels.....	9 00	
To cost of fifty rabbit traps.....	8 00	
Total.....	\$201 00	
By 300 bushels of corn, at 25c. (year's crop).....		\$75 00
Balance.....		126 00
SECOND YEAR.		
Balance, first year.....	126 00	
To 250 trees for replanting failures, at 10c.....	25 00	
To replanting work.....	3 00	
To trimming entire orchard.....	4 00	
To plowing and harrowing land for a crop.....	20 00	
To planting the land, between rows, to corn.....	4 00	
To season's cultivation—corn and trees.....	25 00	
To destroying borers and other insects.....	5 00	
To gathering crop of corn—300 bushels.....	9 00	
Total.....	\$221 00	
By 300 bushels of corn, at 25c.....		75 00
Balance.....		146 00
THIRD YEAR.		
Balance, second year.....	146 00	
To cost of fifty trees to fill failures.....	5 00	
To planting fifty trees to fill failures.....	2 00	
To trimming of entire orchard.....	2 00	
To preparing land, between rows, for a crop.....	20 00	
To planting land, between rows, to corn.....	4 00	
To season's cultivation—corn and trees.....	25 00	
To destroying borers and other insects.....	5 00	
To gathering crop of corn—250 bushels.....	7 50	
Total.....	\$216 50	
By 250 bushels of corn, at 25c.....		62 50
Balance.....		154 00
FOURTH YEAR.		
Balance, third year.....	154 00	
To trimming entire orchard.....	1 00	
To preparing land, between rows, for corn.....	20 00	
To planting land, between rows, to corn.....	4 00	
To season's cultivation—corn and trees.....	25 00	
To destroying borers and other insects.....	6 00	
To gathering crop of corn—200 bushels.....	6 00	
To gathering and barreling crop of apples—50 bushels.....	4 00	
To 16 apple barrels, at 30c. each.....	4 80	
Total.....	\$224 80	
By 16 barrels of apples, first crop, at \$2.....		32 00
By 200 bushels of corn, at 25c.....		50 00
Total.....		\$82 00
Balance.....		142 80

EXPENDITURES AND RECEIPTS—CONTINUED.

	Expenses.	Receipts.
FIFTH YEAR.		
Balance, fourth year.....	\$142 80	
To trimming the entire orchard.....	1 00	
To preparing land, between rows, for corn.....	20 00	
To planting land, between rows, to corn.....	4 00	
To season's cultivation, corn and trees.....	25 00	
To destroying borers and other insects.....	6 00	
To gathering 150 bushels of corn.....	4 50	
To gathering and barreling 100 bushels apples, second year's crop.....	8 00	
To 33 apple barrels, at 30c. each.....	9 90	
Total.....	\$221 20	
By 33 barrels of apples, at \$2.....		\$66 00
By 150 bushels of corn, at 35c.....		37 05
Total.....		\$103 50
Balance.....		117 70
SIXTH YEAR.		
Balance, fifth year.....	\$117 70	
To trimming entire orchard.....	1 00	
To preparing the land for a crop between rows.....	20 00	
To seeding the land to oats and clover.....	15 00	
To harvesting and thrashing oats—200 bushels.....	18 00	
To destroying borers and other insects.....	8 00	
To gathering and barreling 200 bushels apples, third crop.....	16 00	
To gathering 35 bushels apples, culls.....	1 50	
To 66 apple barrels, at 30c. each.....	19 80	
Total.....	\$217 00	
By 200 bushels oats, at 30c.....		\$60 00
By 66 barrels of apples, at \$2.....		132 00
By 30 bushels of apples, culls, at 10c.....		3 00
Total.....		\$195 00
Balance.....		12 00
SEVENTH YEAR.		
Balance, sixth year.....	\$12 00	
To trimming entire orchard.....	2 00	
To mowing, curing and stacking 10 tons clover.....	15 00	
To harvesting 15 bushels clover seed.....	15 00	
To destroying borers and other insects.....	8 00	
To gathering and barreling 300 bushels apples.....	24 00	
To gathering 50 bushels apples, culls.....	2 50	
To 100 apple barrels for crop, 30c. each.....	30 00	
Total.....	\$108 50	
By 10 tons clover hay, at \$3.....		\$30 00
By 15 bushels clover seed, at \$6.....		90 00
By 100 barrels apples, at \$2.....		200 00
By 50 bushels apples, culls, at 10c.....		5 00
Total.....		\$325 00
Balance.....	\$216 50	
EIGHTH YEAR.		
Balance, seventh year.....		\$216 50
To trimming entire orchard.....	\$3 00	
To mowing, curing and stacking 10 tons clover.....	15 00	
To harvesting 15 bushels clover seed.....	15 00	
To destroying borers and other insects.....	8 00	
To gathering and barreling 500 bushels apples.....	40 00	
To gathering 100 bushels apples, culls.....	5 00	
To 166 apple barrels, at 30c. each.....	49 80	
Total.....	\$135 80	
By 10 tons clover hay, at \$3.....		\$30 00
By 15 bushels clover seed, at \$6.....		90 00
By 166 barrels of apples, at \$2.....		332 00
To 100 bushels of apples, culls, at 10c.....		10 00
Total.....		\$462 00
Balance.....	\$326 20	

EXPENDITURES AND RECEIPTS—CONCLUDED.

	Expenses.	Receipts.
NINTH YEAR.		
Balance, eighth year.....		\$326 20
To thinning out each alternate tree.....	\$25 00	
To twice plowing the land.....	40 00	
To destroying borers and other insects.....	8 00	
To gathering and barreling 600 bushels apples.....	48 00	
To gathering culls, 150 bushels.....	7 50	
To 200 apple barrels, at 30 cents each.....	60 00	
Total.....	\$188 50	
By 200 barrels of apples, at \$2.....		400 00
By 150 bushels culls, at 10 cents.....		15 00
Total.....		\$415 00
Balance.....	226 50	
TENTH YEAR.		
Balance, ninth year.....		226 50
To preparing the land for clover.....	20 00	
To seeding to clover.....	12 00	
To destroying borers and other insects.....	8 00	
To gathering 700 bushels apples.....	56 00	
To gathering 200 bushels culls.....	10 00	
To 233 apple barrels, at 30 cents each.....	69 90	
Total.....	\$175 90	
By 233 barrels of apples, at \$2.....		466 00
By 200 bushels culls, at 10 cents.....		20 00
Total.....		\$712 50
Balance.....	536 60	

SUMMARY.

Total receipts—10 years.....	\$2,181 00
Total expenditures—10 years.....	1,211 20
Balance of receipts.....	\$1,069 80
Average per year.....	106 98
Average per acre per year.....	10 69

In the above estimates is not included an estimate of losses which may occur, because no reliable data can be established.

Also, the following :

ESTIMATE OF THE EXPENSES AND PROFITS OF ONE ACRE DEVOTED TO APPLE ORCHARD CULTURE.

BY ABNER ALLEN, WABAUNSEE.

To value of land.....	\$30 00
Interest and taxes—6 years.....	18 00
Cost of trees—60 per acre.....	9 00
Preparation of land for planting.....	4 00
Planting trees.....	3 00
Cultivation for six years.....	60 00
Total cost at six years old.....	\$124 00
By crops grown on the land between the rows.....	\$96 00

NOTE.—Even this season, while the price of such crops has ranged very low, over \$16 per acre has been realized from orchard lands. This does not include fruit borne by the trees. But if the product of the orchard and the land does not cover all expenses accrued to the end of the sixth year, the crops in the seventh year will pay all balance in deficiency and probably leave a handsome sum besides, as the fruit product alone, reasonably estimated, should be at least 120 bushels, worth \$65 on the trees, and purchaser to gather same.

Prices in this market range from forty cents to \$1 per bushel—five cents per bushel for gathering being considered a fair price, and ten cents for delivering in town.

If my estimates are correct, at the commencement of the eighth year all expenses, including value of the land, are paid, and a balance of \$37 per acre in hand. There has been no account herein made of the crop of fruit on the sixth year, which in many instances will be at the rate of 3½ bushels to a tree.

After the eighth year the crop of fruit should yield a handsome profit, even if sold at low prices.

I have noted the yield of apple orchards in this locality for several years, and I find that the Grimes's Golden, Wine, Missouri Pippin, and Chenango, will annually yield about ten bushels. The Ben Davis, Smith's Cider, Winesap, Rawle's Genet, Willow Twig, White Winter Pearmain, Gilpin, Rambo, and some others, will produce an average annual yield of ten bushels, but it will be light in alternate years.

On the fifteenth year twenty bushels yield per tree is not unusual; so that a full crop of an acre of orchard trees at this age should be at least one thousand bushels, or an average of six hundred bushels per acre, of orchards where a general assortment of varieties is planted. One-sixth of this annual average—one hundred bushels per acre, the past season paid a net profit of \$30, which should be satisfactory to the grower, in view of the fact that general farm crops are only worth from \$6 to \$10 per acre the present year.

Sweet and common potatoes, melons, squashes, cucumbers, tomatoes, and other crops requiring cultivation, are most suitable to grow in young orchards.

RECAPITULATION.

To cost of land—10 acres.....	\$30 00
Cost of 60 two-year-old trees, at 15 cents.....	9 00
Cost of preparing land for planting.....	4 00
Cost of planting trees.....	3 00
Cost of cultivating—six years.....	60 00
Interest and taxes, six years, \$3 per year.....	18 00
Total expenses.....	\$124 00
By value of annual crops from the land, not including fruit, six years.....	\$36 00
Crop of fruit on the seventh year, 120 bushels, at 60 cents per bushel—110 marketable.....	65 00
Total receipts for seven years.....	\$161 00
Balance over all expenses, including payment for land at the commencement of eighth year.....	37 00

DISCUSSION OF THE REPORTS.

E. P. DIEHL, Olathe: There is too much neglect with many of our orchardists. There must be more thorough cultivation and enriching of the land, to realize the best profits in the product of our orchards.

F. WELLHOUSE: My estimates are based on 100 trees to the acre, and on my own experience, and the cutting out of every other tree whenever their growth begins to interlock with each other. I would enrich the land after the second bearing year. As to varieties, I have 40 acres of Jonathan, 16 of Cooper's Early White, 16 of Maiden's Blush, 70 of Missouri Pippin, 70 of Winesap, and 210 of Ben Davis. There are two modes of fertilizing the land: First, by summer fallowing the land before planting, and constant cultivation after planted; second, by seeding to red clover and either plowing it under, or letting its growth fall and rot on the ground. As this plant is biennial, the decay of its roots, which form a network and descend to a great depth, not only furnishes enriching material, but also renders the land porous and easily penetrated by water and air.

REV. C. H. LOVEJOY: I am fully convinced that thorough cultivation is the safest course to follow. In orchards so treated the product of this season, even, was fine.

J. M. MILLER, Emporia: The estimates contained in the report of Mr. Wellhouse are no exaggerations, but such results may be realized by any planter. I have found no necessity of reseeded after a good stand of clover has once been obtained.

J. W. BYHAM, Cedar Point: The report is very liberal in the account of expenditures, and the receipts not so much so. I do not know of any orchard in Chase county, which is ten years old and kept in good condition, that does not yield heavier profits. I believe in close planting, and thinning out whenever required.

E. J. HOLMAN, Leavenworth: The estimated receipts given in the report are entirely too low for a thrifty, well-managed orchard. A good ten-year-old tree will yield ten bushels of apples.

A. WILLIS, Ottawa: I believe the estimates of the report are fairly made up, and are an average product of what we may reasonably expect. I know of one orchard of six hundred trees, which has not been satisfactory, and the proprietor would not again plant more than one hundred trees, while others in the same vicinity have been very profitable.

GEO. OLIVANT, Conway: I live in McPherson county, and have an orchard of two hundred trees, which yielded eight hundred bushels of apples in 1884, and one thousand bushels this year. The estimates in the report are too low for other orchards.

SAMUEL REYNOLDS, Lawrence: Thirty years ago I planted an orchard, five acres of which have yielded a profit equal to forty acres in corn.

J. V. RANDOLPH, Emporia: The estimates in the report of profits exceed those of my orchard. I have not yet realized an amount equal to the expenses. My trees are eleven years old. This orchard is located on the bank of the Cottonwood river, and has had good care.

WM. CUTTER, Junction City: I told Mr. Randolph, years ago, that he was ruining his orchard by severe pruning.

Adjourned to 2 o'clock P. M.

AFTERNOON SESSION.

WEDNESDAY, December 7, 1886.

President Johnson in the chair. The Secretary announced the receipt of a letter from Prof. E. Gale, ex-President, which he was requested to read.

LETTER FROM EX-PRESIDENT E. GALE.

LAKE WORTH, FLA., NOV. 17, 1886.

G. C. Brackett, Esq., *Secretary Kansas State Horticultural Society*: Your letter inclosing the resolutions of the Kansas State Horticultural Society on the acceptance of my resignation as President of the Society, has been received, and read with many pleasant remembrances of past associations. It has been my constant purpose to serve the Society as best I could. I have from the beginning regarded that Society as a power for good, destined to grow stronger in years to come. I am proud to feel that you will count me, until my *work* is done, one with you, having, by virtue of my life-membership, a place there until I am called to pass "over the river."

Yours truly,

E. GALE.

Next in the regular order was a paper on the subject of

HANDLING FRUITS.

BY F. HOLSINGER, ROSEDALE.

Were it not for the *new blood* that is constantly coming into our ranks, a report on this subject would be unnecessary, as it has been written upon so frequently that the subject has become *hackneyed*, and for these largely we intend these thoughts, not for the veterans who have already spent their lives in this work; and yet the

work is in swaddling clothes, when we consider that it is but a short time since fruit-growing assumed its present gigantic proportions. Even during our memory has the subject of handling of fruits received its impetus. To go back to the time when a boy of ten to fifteen years, upon the hills of Pennsylvania, I never saw the luscious strawberry or sprightly raspberry cultivated for either home or market, and should anybody have ever dared to plant for a crop of blackberries, they would have been thought visionary, or that they needed a guardian. When any fruit was wanted, we got up early—for in those days it was the “early bird” that got the berries—and were upon the ground at daylight, where the berries grew. How oft have I been wet through by dews in my effort to secure a few quarts of raspberries from some neighbor's fence-row, and what a time we had to secure the prize with some phlegmatic Dutch farmer, and how we condemned him for his hoggishness for claiming that which he never planted, and to which he could have no legal right. Again, how we climbed mountain-sides after the whortleberry (it was huckleberry in those days), and tugged a huge load to our nearest market, a country store, and where we received the munificent remuneration of five cents per quart. This, to our youthful mind, was a princely sum, and stimulated us into still greater achievement in *horticultural* work.

Few gardens in those days could boast other than an occasional gooseberry or the accustomed hedge-row of currants along the fences. Of the larger fruits, the apple, pear, plum, cherry and quince were often found, and occasionally the luscious peach. Everybody raised what they needed, and the surplus was generally distributed among the neighbors. This was about all there was to fruit-growing in central Pennsylvania forty years ago, when I was a boy. How changed! To-day every variety of fruit that possesses merit is carefully planted, cultivated, and marketed. To handle this fruit, then, is that which concerns us at this time. And when we take into consideration the fact that within a generation from the primitive method of fruit-growing of my boyhood, and it was not unlike yours, Mr. President, and you, gentlemen horticulturists of Kansas, who are on the shady side of 50. Could any one have foreseen the march of progress made in horticultural work, and predicted that progress, they would indeed have been denominated as visionary and chimerical. To such proportions has fruit-growing arrived, that whole steamboats and long trains of cars are employed in transporting to distant markets this product. Mr. Kelly, of St. Louis, in his very interesting work on Southern fruits and vegetables, says that in the fall of 1866, when he first went into the commission business in St. Louis, there was but one commission house devoted to the sale of fruits. And that was deemed sufficient to care for all that was consigned to that market. “All the Southern States, including Arkansas and Tennessee, were then unknown as shippers of domestic fruits and vegetables. Southern Illinois was then the remotest point, as a field for such supplies, known to the city of St. Louis, and the fruit season was so short as to be of little value or interest.” Since then the season has been lengthened out to the full year. Railroads are built into every section, and cars are built having a special application to the safety of our fruits. An increase in the number of commission houses to take care of this constantly-growing trade was of course the natural result, and tended to develop and encourage the production.

That there is a growing appreciation of fruit as an article of food, cannot be denied. The more fruit we consume, the healthier we become as a people, and the less doctor bills we have to pay. The fruit-grower has the satisfaction of knowing that he is a benefactor of his race, as well as enjoying a vocation, if *intelligently pursued*, that is in the highest sense remunerative; paying, in fact, much better than numerous other vocations, or business, claiming more public attention, in which considerable capital must be invested, before *results* can be expected. The elements of risks

are not as uncertain as in many other enterprises, and it is therefore a *more inviting field* for persons of limited means.

The most gratifying feature in connection with the growing of fruits is the wonderful progress made toward *utilizing the surplus*. The past few years have introduced so many new and improved evaporators and fruit dryers into many districts where until recently they were unknown, that a fresh impetus has been given to the business. The canning industry has already developed into immense proportions, and scarcely a village can be found in this country without a canning factory, where the surplus fruits are bought and canned. The consumption of these canned goods keeps pace with their production, and offers remunerative prices to all thus engaged. The question of "What shall we do with our surplus?" need *no longer concern the producer*.

LOCATION.

The first thing to consider is the location. Get as near to some good market as possible. Long hauls and rough roads are always to be deplored in the handling of fruit. Packing the fruit is an important factor in the remunerative value of the product. The average shipper has not the slightest idea of what his fruit has to undergo before it reaches the consumer, and what changes may occur and how it depreciates in value, occasioned by the *many handlings* while *in transit* or on reaching its destination.

Growers of fruits, and shippers, would be much surprised if they were to follow *their fruit* to its destination, and when exposed for sale it would be hardly recognizable, unless they had taken the greatest pains in their selections. Inferior fruit must be avoided if you would have favorable results. We know how difficult it is to get the pickers to do their work well, where many are engaged. Inexperienced pickers must be watched closely, that the fruit is handled carefully, and that only good fruit goes into the boxes. Topping off with the best fruit is also a mistake. Let the surface represent a good average of the box. *Your stencil* should be upon your fruit packages, and in this way you will soon become acquainted and known, and your goods sought after. Poor brands will be *avoided*, and will sell at a very heavy discount. Packing is the most important part of the business, and cannot be studied too closely.

CLASSES OF FRUITS.

Strawberries are the first of the season to reach our market. We see them sometimes in March. These are from the extreme southern section of the country. These luscious berries can be found in the market for a period of at least six months, representing the extreme South and North. It is possibly the healthiest of all the fruits, and so extensively cultivated that none need be without it. The fruit should be picked perfectly dry, and not too ripe. For convenience, we use the cheap five-cent basket, writing the name of each picker upon the handle. This holds comfortably four quart boxes, in a single tier. If pickers are experienced, we allow them to place eight boxes in their baskets, to avoid too much walking. With the thumb, pinch off the stem as closely as convenient, place in box until full, and then round off, by placing the stems downward. This gives the berries a nice appearance, showing care, which is always a good recommendation. The Leslie box is the one I prefer, and crates of 24 quarts. Pick at least every other day, and avoid small, unripe and over-ripe berries. Never allow your fruit to remain in the sun, neither allow pickers to set their boxes on the ground. It will pay you to erect a fruit-stand as convenient as possible to the plantation. A superintendent should be on hand to receive, and keep an account with the pickers as they come in with their fruit. In this way they can insure careful work in the picking. If unable to send to market at once,

allow cases to remain open in an *open shed* or room, well ventilated. Never put your berries in a damp cellar. It is highly injurious, and causes fruit to mould. These rules will be found applicable to all small fruit, with slight variations.

Cherries should be handled in much the same way, but always with the stem on. To face them on top will make them attractive. To avoid handling (and this is very important), always pick in quart boxes, same as berries are picked, placing in crates. The slight jarring they receive while being filled will settle them sufficiently, if slightly rounded.

Grapes.—We have used only the 20-pound basket. They are cheap and convenient. Lay the bunches into baskets carefully. Cut bunches off with a knife, never pull, and remove all dried and imperfect berries. Incline the stem downwards; it will give the fruit a neat appearance and attract the buyer. It will pay to pick over a vineyard twice, choosing the better bunches for shipment; the imperfect bunches can be used at home. Delawares, Catawbas, and Goethes can be sold to better advantage if sold in small packages.

Peaches.—Memory fails to serve me at this time just how best to handle this fruit. I rather guess the best way is to have nothing to do with it. Pears, ditto.

Apples.—Should be carefully picked from the tree by hand. Half-bushel baskets are the most convenient to pick in. Handle carefully, so as to avoid bruising. Any form of ladder that is convenient will answer. Have a hook attached to handle, so as to be able to attach your basket to the round of your ladder or to a branch of the tree. Pick only the best fruit. Place in piles upon the ground, unless you have barrels convenient. It would be better to have barrels distributed through the orchard, in which the fruit can be placed, and conveyed immediately to the packing house, ready for packing. Thus protected, they can be packed when the weather is too disagreeable to work out.

For packing, have a table, say 4x8 feet, with raised edges to keep the apples from rolling off. Three bushels can be emptied upon such a table at one time. Place a layer in the bottom of the barrel with the stems down, and then fill up, shaking vigorously to settle. When a little fuller than the chine, press the head down with a screw; use liners to keep the head in place. Be careful in nailing the hoops that no nails project on inside of the barrel, to injure the fruit. The refuse apples can be used for drying, canning, or for vinegar.

Cold storage is an important factor in fruit handling. From the amount of grapes which appear in market out of season, we can form an idea of its value. The Ohio grape-growers are sending out large quantities of this fruit, which has been carefully preserved in cold storage. The first grapes sent out by them scarcely paid expenses; now they bring remunerative prices, and doubtless will pay a large profit. Not long since, seeing a very large shipment in front of a commission house in Kansas City, I asked the gentleman what he could possibly do with so many grapes. "Why, my dear friend, I have only received fifteen hundred baskets in this lot when I ought to have had three thousand!" Think of it—one commission house presuming to handle in one shipment so many grapes. I believe the time is not distant when a cold-storage house will be found in every community. I have learned of a single buyer who purchases annually twenty to twenty-five car-loads of apples, in our Western markets, for cold storage in Baltimore, where he pays 50 cents per barrel for cold-storage privileges during the season. His profits are said to be very fair, as his fruit, kept at a temperature of 40°, remains good until spring, when it is sold. Would it not be possible for those farmers having ice-houses of their own, to construct in connection therewith a *cool room*, where they could keep at least their own supply of fruits and vegetables at small cost? I think the plan feasible, and am

thinking of building such a room. There are numerous plans for the construction of buildings to keep fruit, and *good ones* as far as they go, but I think that any house to be perfectly successful must have the temperature regulated with ice.

DISCUSSIONS OF THE PAPER.

J. G. SAMPSON, Derby: Pears are a grand success in Sedgwick county. My trees bore over fifty bushels this year, which were as fine appearing as any California pears, and much richer in quality.

J. W. BYRAM, Cedar Point: Pear trees are reliable in Chase county, and the people have confidence in them. The crop of 1886 was heavy. Some trees yielded from eight to ten bushels each. One orchard of 700 trees produced a heavy crop. I have never known the Kieffer to blight but in one instance, and that was in Emporia, where it killed to the ground. But as blight was quite general at that time, it may have resulted from contagion.

B. F. SMITH, Lawrence: Peach trees, in my opinion, are exhausted because of the long time they have been under propagation. We need to start a new strain, from seed.

REV. C. H. LOVEJOY, Vinland: I have pear trees now twenty years old, which are productive. Very few have failed from blight. Can't see any reason for discouragement in planting. Have grown peaches for twelve consecutive years, but failed during the last three or four years.

I. HORNER, Emporia: The expression in the paper, "Ditto pear," should not be counterfanned by this Society.

Discussion closed.

PRESENTATION OF A GAVEL.

Capt. E. P. Diehl asked the attention of the Society, and said:

MR. PRESIDENT: At the suggestion of our Secretary, I wish to present to the Society, through you, this beautifully wrought gavel, for the double purpose of saving your knuckles in calling the meeting to order in the future, and placing a relic in the care of this Society. In company with our worthy member, Maj. Frank Holsinger, and his estimable wife, we drove to the old orchard of the Rev. Thos. Johnson, at the M. E. Mission grounds, near Shawneetown, and cut the section of an apple tree which has been constructed into this gavel, from a Newtown Pippin tree planted in 1827—50 years ago, being the first (so far as any knowledge obtained) planting in Kansas. This tree is in healthy condition, and fruitful at this time. There is an interesting coincidence in this matter. The tree was planted and grown by a Mr. Johnson, and in Johnson county, and this relic is now placed in charge of your Society, through your President, who bears the name of *Johnson*.

The President, in accepting the gavel, made a very appropriate response acknowledging the usefulness and value of the gift.

The President then resumed the regular order of the program, and announced the consideration of the Apple Manual, which on motion was unanimously adopted as read by the Secretary.

The Pear Manual was then considered.

On motion to adopt, Mr. F. HOLSINGER said, in support of the recommendation of the use of ashes as a manure: I will state that a tree near my dwelling, around which the contents of the ash-hod has been emptied until the ashes are a foot deep, is in vigorous, healthy condition, while others not so treated have blighted. There are three pear trees on the Rev. Thomas Johnson's farm, planted forty-one years ago, whose average diameter is two feet, which have never blighted.

A paper on the subject of profits and loss in pear culture, was read by J. L. Williams, Oswego, as follows:

**ESTIMATED PROFITS AND COST FROM ONE ACRE OF PEAR TREES,
FOR A TERM OF TEN YEARS.**

BY A PRACTICAL GROWER AND PROPRIETOR OF AN ORCHARD OF 4,000 TREES —
J. L. WILLIAMS, OSWEGO.

The items of expense are identical with those given by Mr. F. Wellhouse in his estimates of cost of an apple orchard of ten acres, allowing for the difference in acreage, and the rate of cost between apple and pear trees; and the receipts will vary according to the value of the fruit in the market and the extent of respective productiveness of the two classes. Therefore, I need only to give the aggregates in either line, to show whether pear culture is a profitable pursuit to follow.

First year, total expenses.....	\$80.00	Sixth year, total expenses.....	\$30.00
First year, total receipts.....	5.00	Sixth year, total receipts.....	100.00
Second year, total expenses.....	30.00	Seventh year, total expenses.....	30.00
Second year, total receipts.....	5.00	Seventh year, total receipts.....	125.00
Third year, total expenses.....	30.00	Eighth year, total expenses.....	50.00
Third year, total receipts.....	5.00	Eighth year, total receipts.....	150.00
Fourth year, total expenses.....	40.00	Ninth year, total expenses.....	50.00
Fourth year, total receipts.....	50.00	Ninth year, total receipts.....	175.00
Fifth year, total expenses.....	25.00	Tenth year, total expenses.....	50.00
Fifth year, total receipts.....	80.00	Tenth year, total receipts.....	200.00

SUMMARY.

Aggregate expenses for 10 years.....	\$415.00
Aggregate receipts for 10 years.....	895.00
Balance for 10 years.....	480.00
Average balance for each year.....	48.00
Profits per acre.....	48.00
Less estimated value one acre of land.....	\$25.00
Less taxes, &c.....	1.00—
Net profit per acre.....	22.00

In these estimates I have calculated on 200 trees to an acre. If they are properly taken care of, at the end of the tenth year they will be in a highly productive condition.

DISCUSSION OF THE PAPER.

I. HORNER, Emporia: I believe that the soils in Harper county and southwestern Kansas, which contain a large amount of iron in composition, will prove to be a successful district for pear culture.

C. H. LOVEJOY, Vinland: I have some such soil, and there have been a few cases of blight on trees there planted.

GEO. OLIVANT, Conway: Pear trees are being largely planted in western Kansas. I have trees eleven years old which have been fruiting during the last four years, yielding an average of four bushels to a tree. There have been no cases of blight among them.

J. B. DOBBS, Antelope: Mr. Wm. Billings, of Marion, has been so successful with the pear that he prefers to plant them rather than the apple.

DR. CHAS. WILLIAMSON, Washington: I am advising planting this tree on our high iron soils. It is successful in Washington and Republic counties. We must give more attention to the study of soils, their character and adaptation.

L. A. SIMMONS, Wellington: Coal ashes are beneficial when applied to pear trees at the rate of a bushel to a tree; also when applied to peach trees. Pear sprouts from around old trees make fine stocks for budding on.

WM. CUTTER: Good trees may be grown from such sprouts.

J. V. RANDOLPH, Emporia: My pear trees have been heavily treated to coal ashes, but are mostly dead, nevertheless.

A. C. GRIESA, Lawrence: Some varieties suffer more from blight than others. I would ask about the Kieffer and LeConte.

J. W. BYRAM, Cedar Point: The Kieffer will kill to the ground.

E. J. HOLMAN, Leavenworth: The Kieffer was the first to yield to blight.

F. HOLSINGER, Rosedale: Kieffer, LeConte and Birkett all blight with me.
 ROBT. MILLIKEN, Emporia: The Kieffer, both standard and dwarf, blight.
 J. L. WILLIAMS, Oswego: The Kieffer and LeConte have blighted in many places.
 I. HORNER, Emporia: A dressing of the land is the best remedy for blight.
 J. M. MILLER, Emporia: Twenty years ago I planted a lot of pear trees; these escaped blight until recent years. Four years ago I set among these some young trees; these blighted this year.

Discussion closed.

CHERRY MANUAL.

The committee having the preparation of this manual in charge reported, and on motion it was unanimously adopted.

MANUAL OF THE NECTARINE.

On motion, the Secretary was instructed to place the nectarine under the recommended culture for the peach.

QUINCE MANUAL.

On motion, the preparation of this manual was placed in charge of the Secretary.

DISCUSSION ON QUINCE CULTURE.

GEO. OLIVANT, Conway: This fruit is grown quite successfully in some portions of western Kansas.

W. HOLLINGSWORTH, Emporia: I have trees twelve years old which have fruited during the past five years.

W. E. FOSNOT, Hutchinson: They succeed in Reno county, and require plenty of water.

J. W. BYRAM, Cedar Point: My trees suffer from blight.

WM. CUTTER, Junction City: Trees blight with me.

COSTS AND PROFITS OF A PEACH ORCHARD IN COWLEY COUNTY.

BY J. NIXON, WINFIELD.

	Expenses.	Receipts.
ONE ACRE, FOR SEVEN YEARS.		
To plowing and harrowing.....	\$2 00	
To cost of 134 trees.....	13 40	
To cost of planting 134 trees.....	2 00	
To rent of land; at \$3, for four years.....	12 00	
To interest on cost of trees and labor, four years.....	6 96	
Total.....	\$36 36	
NOTE.—It will be safe to depend on the crops grown between trees to pay all of this expenditure.		
FOURTH YEAR.		
By 67 bushels of peaches, at 50c.....		\$33 50
FIFTH YEAR.		
To rent, tillage, and manure.....	20 00	
By 134 bushels of peaches, at 50c.....		67 00
SIXTH YEAR.		
To rent, tillage, and manure.....	20 00	
By 268 bushels of peaches, at 50c.....		134 00
SEVENTH YEAR.		
To rent, tillage, and manure.....	20 00	
By 402 bushels of peaches, at 50c.....		201 00
EIGHTH YEAR.		
To rent, tillage, and manure.....	20 00	
Crop failed.....	116 36	
Balance for eight years.....	319 14	435 50
Profits for one year, about (\$39.93).....		40 00

NOTE.—My peaches have netted me \$1 per bushel so far.

Meeting then adjourned to 7 o'clock P. M.

EVENING SESSION.

WEDNESDAY, December 7, 1886.

President Johnson in the chair. The evening's exercises opened with music by the Zazoo club, of Emporia.

Following very appropriate addresses of welcome were delivered to the Society by A. R. Taylor, President of the State Normal School; Col. A. M. Flory, of Emporia; and J. V. Randolph, President of the Lyon County Horticultural Society, which were responded to by Hon. Chas. Williamson in behalf of the Society.

The following paper was then read:

THE IMPORTANCE OF HORTICULTURE TO A SUCCESSFUL SETTLEMENT OF WESTERN KANSAS.

BY HON. J. B. SCHLICHTER, STERLING.

The term "Western Kansas" in this paper applies to that portion lying west of the one-hundredth principal meridian. All this region is now rapidly settling up. Several important railroad lines are promising to traverse it. New towns are being started, promising to be centers of trade. Very soon all these vast plains, which but a few years ago were supposed to be doomed forever to the cow-boys, are to be dotted with beautiful villages and cosy farm houses, beautiful with waving cornfields, orchards, groves and hedges; and instead of the long-horned Texans trailing over a "thousand hills," we are to see bunches of high-grade, plump, stall-fed cattle in every barnyard, and these barnyards are to be found on at least every half-section of land. There will be great corn cribs *bursting* full of ears of corn; cellars stored with potatoes, apples and canned fruits; lawns covered with blue-grass, ornamented with beautiful shade trees, shrubs and flowers; happy homes, filled with merry children, blooming youth, wholesome literature and charming music; schools, churches, manufactures, and all the appliances of industry, art, education and culture. The outline of this picture is already in existence in the shape of the plain and rude prairie cabin, which is always the *first fruit* of a new country, and the fullness of the "vision" will shortly come to pass.

Things repeat themselves. What has been transpiring in the more easterly portions of Kansas during the past thirty years is now in its inception in western Kansas.

Some of these new settlers have capital to make a good start, and will soon surround themselves with the conveniences and comforts of life. Others have means that are barely sufficient to build a cabin, break the sod and make a living until they can raise their first crop. If that fails they are in bad shape. Others are quite poor, and can only enter their claim, build a sod house or creep into a "dug-out." The husband will leave his wife and children there while he seeks employment elsewhere to furnish provisions and clothing for them. This condition of things usually results in hardships, suffering and discouragement, and ends in a pulling up, selling out, or abandonment, and a going back to the "kin-folks."

This was the condition of affairs in this central portion of Kansas about thirteen years ago. In traveling over Rice county now one can see the picture we have drawn, almost fully realized. If the same condition of climate, circumstances and soil have an existence in western Kansas as here, the picture will come to pass as soon as the energy and enterprise of the settlers can bring it about. Soon the problem will be solved whether western Kansas can support an agricultural population. This problem, which was held in doubt thirteen years ago in the central por-

tion of Kansas, is now solved. In 1879 and 1880 the idea was abandoned, and there was a general stampede from this county and the settled portions west of this. Many claims were abandoned. In Rice county farms were sold for \$300 that now could not be bought for \$2,000. There was a general doubt and gloom in the minds of the oldest settlers. But confidence has been fully restored, and the problem is settled for all time to come. Will thirteen years tell the same story for western Kansas?

The present indications are all favorable. This country is filling up with a living, moving, active, enterprising population. Towns are growing. Real-estate men are speculating in town property and lots are being sold at fabulous prices. The sod is turned over, trees are planted, and there is a rapid progress and advancement in agricultural pursuits. All this that is going on now is the process of solving the problem that is still held in question, whether this vast plain in western Kansas will sustain an agricultural people? Whether people there will become prosperous and opulent in the pursuit of farming as they have in the eastern portions of the State?

In connection with this, another problem must and will be solved, viz.: Whether that region will grow domestic fruits—whether it will be suitable to profitable horticulture? No doubt, as in the settled portions of our State, the people who settle on these plains have emigrated from fruit-growing countries. Many of them, perhaps, have once owned fine orchards and fruitful gardens, and will not be contented to remain in their new homes unless they can at least in a measure reproduce them. The new settler must have fruit. He cannot long be content with bacon, beans, and hominy. He will plant fruit trees. The tree-peddler always follows the emigrant to his new home, and with his nice pictures easily entices him to give an order for trees and shrubs. Of course, as in the history of all new settlements, there will be losses, failures, discouragements, and in ten years from to-day, and not before, the problem as to the adaptability of that country to profitable and successful horticulture will be partially determined.

We claim that this is an important problem for western Kansas. If it can be assured or determined that fruit will grow in that region, its prosperity is at once assured. Do we know of any country that does not produce fruits of some kind that is settled with a prosperous and civilized people? Can civilization and horticulture be separated? Can any people be thrifty—that is to say, be prosperous in art, science, and commerce—without fruit-growing? Even the stunted Esquimaux, in the land of ice and snow, finds berries to eat part of the year. Mankind cannot live, and grow, and develop properly in the scale of being, without fruit. Western Kansas *must* grow fruit and trees or be abandoned by the farmer and horticulturist.

Here is the dilemma. It is one of two things: *Plant and grow trees*, or leave the country. Which will he do? They who will stay by their homes and with energy and persistency prosecute the work of tree-planting, will be the benefactors, if not of themselves, at least of their children and children's children. If they cannot afford to do this much for their progeny, they had better leave now, for tree-planting is a necessity on these wide and open prairies. There can be no successful development without it. There must be barriers to break the force of the wind. Trees will do this. A certain percentage of the earth's surface must be shaded, to prevent the too rapid evaporation of the moistened surface after a fall of rain; must be kept cool, to induce condensation of the moisture in the atmosphere. Groves and forests will do this.

Will the country grow trees? Will it produce fruit? These are vital questions to the people of that portion of the State. The fertility of the soil and the mildness of the climate are two very favorable conditions. The only unfavorable condition is the apparent dryness of the atmosphere and the limited amount of rainfall. These

conditions can in some localities be overcome by irrigation. In close proximity to the Arkansas river, where we find the substratum of water near enough to the surface to be reached by the roots of trees, some varieties of fruits can be grown without irrigation. But the fact cannot be disguised: there must take place a material modification of the climate before general horticultural pursuits will succeed. Nor will general farming succeed until that takes place.

It is doubtless true that tree-planting will bring moisture. If this is so, then the importance of horticulture to that region is quite apparent. The thing to do, then, is to plant trees largely; but many of these will die before the climate will be sufficiently modified to grow trees. There will be seasons of drouth, such as we have known to occur, that will make a clean sweep of the tree plantations. How was it in the early settlement of Rice county? On my own place I have lost more trees than I have now growing. By continuous planting I have secured a good stand of trees.

It will not pay for the new settler to invest in novelties and high-priced new varieties. He must ward off the tree-peddler with a 20-foot pole. He must deal with the tree-grower, and secure one-year-old seedlings, which can be bought at very low rates.

I would favor the idea of planting one-year-old apple seedlings, growing them in close nursery rows for several years, in some favorable and sheltered spot. These can be bought at very low figures from the growers, and if they should fail the loss would not be great. Almost anyone can readily learn how to graft or bud, and thus in a short time the western settler can grow his own trees, which he can transplant into his orchard, at a trifling cost, at favorable times of the season. In this way, also, the trees will become acclimated by the time they are ready to transplant into the orchard.

The probabilities are that not many of the original settlers will stay long enough to eat fruit of their own raising. They will become discouraged and sell out, and their successors will reap the rewards of their hardships and toil. This is a history that has often repeated itself in more favorable climes.

The process of modifying the climate of these western plains in this single-handed way will be long and tedious. The undertaking is questionable on account of the magnitude of the work. Now here is a seeming contradiction. A certain cause is to produce a certain effect. But the effect is essential to the success of the cause. In other words, a modification of this dry climate is essential to the successful production of trees and fruits, but the planting and production of these trees and fruits are necessary to bring about this modification of climate; or more concisely, trees must first be grown before they can be grown, which is an absurdity. There is something wrong in this theory. In general this is true; in particular it is not. That the planting of trees—on a large scale of course—will change the conditions of dry and arid regions, is conceded science; but to bring it about by the single-handed effort of the squatter and homesteader is an absurdity. It must be commenced in localities favored with a moist soil, such as are found in ravines and creeks, and river bottoms—with varieties of trees that will endure drouth and grow rapidly. These will require close planting, extra care, and thorough cultivation. We cannot give place for the full discussion of this question here. Our State Legislature ought to do something to encourage tree-planting in western Kansas. Our timber act provides for only ten acres of timber on a section of land. The homesteader that grows ten acres of good timber on the plains ought to have a certain bounty, and receive credit for it against his annual tax. Timber belts and wind-breaks must be the first consideration of the fruit-grower. Fruit can be raised wherever these can be grown. These will have to be the first steps in the solution

of the problem whether agriculture and horticulture can be made a success in western Kansas.

This was followed by

THE PRESIDENT'S ANNUAL ADDRESS.

BY GEO. Y. JOHNSON, LAWRENCE.

MY FRIENDS: As the twentieth annual meeting of the Kansas State Horticultural Society is now in session, it will be well to pause upon the eve of our majority, and take a survey of the past, with its accomplishments, that we may be better able to formulate plans for the future, and pursue a direct line of labor, subject only to such changes as unexpected variations in the course may make necessary.

For the first several sessions our discussions were devoted mainly to the apple, and for the first five years our attention was occupied with the questions of how to plant, what to plant, when to plant, and where to plant? Following closely upon these questions, the care of the orchard, and many were the bloodless battles fought how to prune, when to prune, or whether to prune at all; and for several sessions this wordy warfare was carried on, until the older members had their respective speeches and those of their opponents upon the subject so completely memorized that almost any one of them was a walking cyclopedia, and could have made all the speeches and produced all the arguments upon both sides for the entire army of disputants—taxing very severely the ingenuity of our worthy Secretary for original matter with which to make up a valuable volume of transactions for publication and distribution. That he succeeded in passing successfully through “exposures,” “varieties,” “pruning,” “low and high heads” without a severe attack of the “blight,” speaks well for his vitality as well as versatility, and augurs a long life of usefulness to the Society, and passing through a “green old age” into a resurrection of perennial youth.

Year by year new members were added, and these discussions went on, and after adjournments of the respective meetings each disputant returned home to anew put into public practice his own theories, and into obscure and secret trial the theories of his opponents, until year by year, and little by little, each has in a manner modified his convictions, and the members have unconsciously drawn closer and closer towards each other's views, until a middle ground was reached, and it has been made possible to send out as the aggregated wisdom and experience a “Manual upon the Apple,” as applicable to the State of Kansas, that is so nearly complete that the beginner may take it as a guide, and study it, plant according to its directions, and have in the beginning the full benefit of over twenty years' experience combined of apple-raising in Kansas. As each man, who has by success as well as failure helped to make up this experience, views the result of his own efforts in the past, and compares it with his probable success had he only had such a guide at the first in selecting, planting, and care, he is fully convinced that from the standpoint of general prosperity, had our Society never produced any other result than this manual, it would have been cheap to the State at the entire cost of its support.

In 1873 the Society began to give some attention to the subject of forestry, and many addresses were given and discussions were had in the meetings, upon the importance of the subject and the varieties of trees best adapted to successful planting in the different sections of Kansas, until in 1884 a manual of forestry was published, containing much information and instruction gained up to that date. That it is very incomplete, none are better aware than those who contributed to its make-up, and it is very desirable that more effective measures be used to bring the matter before our people in such a manner as to fully arouse them to the importance of the subject of forest-tree planting.

The planting of groves and shelter belts, in the economy of feed to our live stock alone, is an item of no inconsiderable saving to the people of Kansas; and when any man estimates the difference in the amount of feed necessary to keep an animal heated enough to retain life, that has the protection given by the sheltered side of a barbed-wire fence during a blizzard, and to keep one in good condition protected by a dense grove or wind-break, he will not for a moment doubt that the farmer and stock-grower is most of all interested in the growing of such protection as is afforded by groves and shelter belts.

In this connection, I desire to call your attention to the necessity of a general and intelligent arrangement of these groves, &c., so that the fierceness and force of high winds may be broken instead of being aggravated.

This can only be done by a general forestry commission, or what might be more properly called a topographical survey for forestry purposes; a study of the direction of prevailing high winds, and a charting of the places forest trees should be planted so as to break the force of these and assist nature in softening their force, and avoid having funnel-shaped openings through which storms will rush, carrying everything before them.

If it was thought inexpedient at first to make this law general, an enabling act might be passed, allowing counties, upon certain conditions, to have their surveyors make this survey, under such directions and instructions as formulated by the State Horticultural Society, or some competent authority designated by it.

An exemption from taxation for a certain number of years of all well-kept natural forests, or artificial plantings, would stimulate much planting; while a bounty of so much per acre upon timber land, natural or artificial, to be allowed as an abatement upon the entire taxes, would do much more, and in a few years would add many times the cost to the State in increased values.

If the State could be completely informed upon the climatic influences of forestry, there would be no difficulty in means being provided, ample for this survey being made general, and liberal bounties allowed for care or planting of trees. This topographical chart should be recorded in the county register's office and a duplicate furnished to this Society, that upon application of any man owning land and desiring to plant, full instructions could be given as to what varieties, and where to plant that best results might follow.

We are only in the alphabet of this subject of forestry.

At the present time a destruction of the forests is going on in the mountains west of us that will, in the near future, be very likely to make a vast difference in the distribution of our rainfall in this State during the growing season, which may result in changing climatic conditions with us in such a manner as to make in the future great doubt of successful farming.

The manner of this being the effect has been explained and reexplained to this Society so often that it is useless to consume your time at present with a repetition of well-established facts. As we do not live in Colorado, we cannot to any great extent influence legislation in that State, but we can exert ourselves to enlighten the public mind in Kansas, to stir up our people to use the means in their own hands, in building up a protection against the results of this wholesale destruction by rearing within our own borders living forests to attract, store, and hold the moisture in the rainy season, and by giving off the moisture gradually cause gentle rains at that season we are most in need of them for our growing crops.

We need to stir up thousands of earnest, active men into an enthusiasm upon this subject, until it goes down into every school district and creates a ground-swell upon this subject that will gather force as it progresses, and carry to success the object through all obstacles.

Our people, when they fully understand and realize the importance and profit of the work, and the impending danger of inaction, will act in the right direction, moved as men by an impulse. Ours is the work of pressing the importance of the subject.

Upon the subject of small fruit, our Society took but little note, except upon the strawberry and blackberry, for several years. In 1874, a standing committee upon this subject was provided, and reports have been made of greater or less extent since that date, and gradually the range has been extended until the great importance of this subject is acknowledged and indorsed heartily by the Society, and at this meeting is presented a draft of a manual upon small fruits and small-fruit culture similar to the manual upon the apple.

Your most careful attention should be given to this matter, that the good name of the Society should be not harmed, or its reputation injured, by sending out misleading information to the people of Kansas. The manual, like its predecessors, should be the essence of the successful experiences of a quarter of a century's trial and proof.

In our discussions as individual members, the widest range of opinion and greatest freedom of belief can be indulged in, and is right and proper; but a promulgation of a *teaching or text-book* by our Society, must not be hastened with a speed that will cause the publication of false teachings. Better wait awhile longer than to fail in this particular. Endeavor to establish and keep a reputation for correctness, that a "Thus saith the Kansas State Horticultural Society" may with good reason have all the assurance of truth to the young horticulturist that a "Thus saith the Lord" ever had to a true and faithful Israelite.

A manual upon stone fruits and their culture should be begun and carried along for the next year or more with our other work, and as soon as our small-fruit manual is disposed of we may have it sufficiently prepared and digested by the committee for presentation and careful consideration by our membership at large. We have about so much *power*, and we must husband it and not attach more machinery than can be profitably operated, that the work undertaken may be thoroughly and creditably done. The small-fruit manual is before us. The manual on the apple is published, but is subject to amendment as time passes and adds experience. The forestry subject is far from completed, and in my humble opinion should be the leading work of the Society for years to come, as upon its successful issue depends to a large extent the profitability of all other planting.

I have no unfriendly criticisms to make of the work accomplished in the past, for the Society has accomplished much and added untold wealth to the State. I am only giving a caution against attempting too much at one time. Let us keep the other subjects in mind, and be preparing them. It took us eighteen years to gather sufficient experience—with ten years' previous haphazard planting and its results to aid our investigation—to justify us in publishing a manual upon the apple. Let us therefore make haste very slowly upon future efforts of the same character. The developments of horticultural facts are necessarily much slower than those of agriculture. A farm crop is planted, cared for, grown and harvested in from four to nine months, and its degree of success or failure known within a year of the beginning of the experiment. In stock-breeding the good or bad effects of certain lines of breeding or cross-breeding can be fully demonstrated in from eighteen months to five years, and the full measure of profit or loss be known and future experiments be guided accordingly—the loss seldom being a total one, as the produce has a market value that will generally pay the expense of the experiment. But the man who plants fruit trees must wait from eight to twenty years for their results, and fre-

quently at the end of that time finds he has failed completely, and that no fruit rewards his care and expense, no profit is returned for his patient waiting.

The State cannot afford the waste of this effort, and hence the wisdom of State aid in gathering and distributing the information necessary to enable beginners to make selections giving reasonable assurance of success.

"Horticulture is agriculture's fine art," and that it is in the aggregate a very profitable branch of industry to the country at large, is shown in the fact that the forestry and horticultural products of the entire Nation aggregated in 1879 six hundred and thirty-five millions of dollars, or nearly as much as all the cereals combined. Take out the forestry productions, and we yet have an amount almost equal to all the cereals combined, except corn. There appears by the reports to be almost seven hundred millions of dollars' value invested in orchards alone, to say nothing of other branches of horticulture, thus showing to some extent the magnitude of the horticultural interest and its relation to the general prosperity.

Living as we do in a prairie State, where the benefits to agriculture by influence are so great and capable of being increased to an almost indefinite extent, we need to be on the alert, to foster every aid to our calling; and this brings us face to face with the question of how we can best accomplish that end in the future.

First, I would suggest that the time is not far distant when the annual meetings should be held permanently at some one place, and though it may not yet have arrived, it is well to have a thought in that direction. Living as I do in the county that has for twenty years derived the greatest benefit from this Society by reason of having the executive office located in our midst, it is with some degree of hesitation that I proceed upon this subject, and speak my convictions. Yet, being convinced that the State at large would be more greatly benefited by a different course, and as the suggestion has hitherto not been made from any other section, I will proceed, and then leave the matter in your hands, believing that, free from all local prejudices, you will take that action best calculated to produce the greatest good to all.

My second suggestion is this, that the Legislature be requested to—

1st. Organize this Society into a State Bureau of Horticulture.

2d. That the officers and Board of Trustees be made a State Board of Horticulture.

3d. That the Governor, Secretary of State and State Superintendent of Public Instruction be *ex officio* members of said Board.

4th. That the Legislature direct the Executive Council to set apart well-lighted, convenient and commodious rooms for the use of the State Board of Horticulture.

5th. Ask that a reasonable salary be paid the executive officers of this Board, payable in same manner as other State officials.

6th. That a reasonable allowance be made for cabinets, books of reference, and clerk hire, etc.

7th. That all officers except the *ex officio* members of the Board be elected by this Society to hold office two years, except the three trustees, who shall be elected one each year.

8th. That the Secretary shall be the executive officer of this Board.

An arrangement of this kind would place the office, executive officer, library and cabinet in the State capital, where he would be most accessible to our membership, and, by seeing those most interested throughout the State, keep the work better in hand and accomplish much more good. It would also provide a salary which would justify him in devoting his entire time and energies to this important work. Casts could be made of all the old standard fruits, and new varieties as they were produced, and make one of the most pleasing places to visit at the State capital, and afford not only a good advertisement for the State, but also a fine school of reference for the student of horticulture. Cabinets could be made up of birds and insects, bene-

ficial and injurious, all named and classified. A place could be provided for our present valuable and increasing library.

The details of the work are so very different that it is thoroughly impracticable to combine or consolidate this work with the State Board of Agriculture, and no one is more thoroughly aware of this fact than our present able Secretary of that body; and though I have heard it suggested, I doubt if any well-informed citizen of Kansas has ever seriously entertained the idea.

Every argument is in favor of making the move suggested, except one, and that is, that it will increase the expense to the State. But as our Secretary is already drawing his salary direct from the State, the increase of expense will be so very small that it cannot be deemed any real objection. In the present case he draws an inadequate salary, and is allowed to superintend his own private business. In the proposed change the Secretary would be paid a better salary, and be required to devote his entire time to the work.

Having said this much, the subject is left with you for such disposition as you may deem wise and prudent.

Since our last annual meeting this Society has lost, by removal from the State and resignation, our time-honored President, Prof. E. Gale. Elected in December, 1874, he served without intermission until his resignation in 1886. That he presided with ability and impartiality, will be averred by every member of this Society, and our regret is great that failing health made it appear necessary for him to sever his personal and official affiliations with our Society, and all will join in wishing him restored health and temporal prosperity in his new home.

On the removal from the State of President Gale, our Vice President, Judge M. B. Newman, of Wyandotte, became acting President, and very ably and acceptably filled the office until the day of his death, which occurred only a few days prior to our last semi-annual meeting. As an evidence of his love and loyalty to the Society, it would be proper here to state that the last work of his life was to complete his semi-annual address to this Society, which was forwarded after his death and read by your acting President at that meeting. Our committee on obituaries will present to you for consideration and adoption resolutions of respect to his memory. Not a member of this Society but feels that in the death of Judge Newman he has individually lost a brother beloved. So full was he of the hope of that awakening and dwelling in the glorious hereafter, beneath ever-vernal trees, that, when his friends gathered around his bedside to bid him his last adieu, his parting words were: "Don't say good-bye, but say good-night, and we will all meet and bid each other welcome in the everlasting morning." Thus passed away a brother beloved; gone on before to wait and welcome us one by one to the rest beneath the tree that bears its fruit every month, and the leaves of which cure all ills, a salve to every bruised heart, and for the healing of the nations.

Be it our mission to so cultivate trees, fruits, and flowers, and develop the vernal beauties committed to our care by Nature's own God, that when the shades of our evening fall about us, the halo of a life well spent, and work well done, will so light our pathway that the transition will only be one of degree; the closing of our eyes as an innocent, weary child to sleep, and an awakening to strength and freshness of perpetual youth in the everlasting morning.

At the close, on motion, the address was referred to the following committee: Hon. Charles Williamson, Washington; Hon. R. E. Lawrence, Wichita; Frank Holinger, Rosedale.

The President of the State Normal School extended the members of the Society a hearty invitation to attend the morning exercises at the assembly rooms, which was accepted with thanks.

Adjourned until 9 o'clock A. M. to-morrow.

FORENOON SESSION.

WEDNESDAY, December 8, 1886.

The Society was called to order by President Johnson, and the subject of apricot culture discussed, as follows:

APRICOT CULTURE.

E. J. HOLMAN, Leavenworth: I have not had any experiment with the Russian apricot, excepting with a few trees recently planted, which seem to be hardy. The common varieties are not enduring, and no more certain in fruitfulness than the peach, and I cannot recommend them.

C. H. LOVEJOY, Vinland: Ten years ago I planted three trees; one of these has made a remarkable growth, but has not been productive.

J. G. SAMPSON, Derby: I have forty trees large enough to bear five bushels each. They blossom and set their fruit, but it becomes wormy and commenced to drop off, and at ripening-time scarcely any are left.

L. A. SIMMONS: The trees are hardy in Sumner, Harper, and Sedgwick counties; are given same culture required for the peach. The Moorpark and Early Golden bear fair crops of fruit, which have been severely injured by the curculio.

J. W. BYRAM, Cedar Point: There are trees of the Moorpark and Early Golden in a garden at Cedar Point, which bore well until within a few years. The curculio has been destroyed by the jarring process. This fruit has been so promising that it has been generally planted throughout the county. Of the Russian seedlings some are good and very promising, but most are poor.

J. V. RANDOLPH, Emporia: I have planted quite a number of trees of the Russian apricot, and shall make a poultry yard of the ground for the purpose of suppressing the curculio. I feel confident that I will succeed.

I. HORNER, Emporia: Among the Mennonites the apricot is generally vigorous and hardy; very few borers are found among them. Of some, the quality is luscious, and others are very inferior. The best are obtained from carefully-selected seed.

J. A. CLEVELAND, Madison: Some years my trees are fruitful.

A. C. GRIESE, Lawrence: Mr. Horner seems to intimate that our only course to propagate this fruit is by selected seed. I would ask, why not as well to propagate selected sorts by budding, as other fruits are?

F. HOLSINGER, Rosedale: A lot of trees planted 23 years ago, on a high point with a northern slope, three miles west of Kansas City, have done well and are healthy.

C. G. McNEIL, Stafford: I wish to emphasize the recommendation which has been made, to propagate through selected seed.

Discussion closed, and the Plum Manual was considered.

THE PLUM.

J. L. WILLIAMS, Oswego: I move to strike out Mariana and Bassett plum from the list.

A. WILLIS, Ottawa: If the Mariana is so very valuable, why is it used for a stock on which to propagate other sorts?

F. HOLSINGER, Rosedale: The peach is an excellent stock for the plum. The plum stock is inclined to sprout up, like the Morello cherry. I have the plum on peach stock which was planted in 1876, and they are now sound and healthy. All strong, upright growth should be cut back. I would not have poultry confined to the orchard. They make filthy work. The jarring of trees to destroy the curculio is a very simple process. I let two boys spread a sheet under the tree, and then

with my foot strike the trunk of the tree. This causes the curculio to fall onto the sheet, which are gathered into vessels and scalded to death. The sheet is then run under another tree, and so on until the orchard has been gone over. This can be done almost as fast as a man can walk. The process should be followed up each day during the fore part of the season, until all are captured. The Wild Goose and Miner only are profitable with me. When picking, assort into two classes, putting the soft fruit in one box for home market, and the other into another for shipping.

J. W. BYRAM, Cedar Point: One of my neighbors practices the same method of jarring recommended by Mr. Holsinger, excepting that he trains a hen with a brood of chickens to follow and gather in the curculios. I cannot recommend the plum stock for the plum, because of its disposition to sprout from the roots.

B. F. SMITH, Lawrence: The Mariana promises to be a valuable sort.

F. HOLSINGER, Rosedale: In jarring trees with the foot, care must be used not to bruise the tree by giving too strong a stroke.

Motion to strike out the Mariana and Bassett failed.

On motion, the Yellow Chickasaw was added to the list, on suggestion of Mrs. Chas. Williamson.

On motion of Mr. Schlichter, the Secretary was instructed to add Mr. Holsinger's method of destroying the curculio to the Plum Manual, also to include the apricot with the plum, and the motion to adopt prevailed.

Next in order was considered the report of the committee on a small-fruit manual, which after a few minutes' discussion was unanimously adopted without change.

The following paper was read:

SMALL FRUITS, INCLUDING CHERRY AND GRAPE CULTURE, IN ELLIS COUNTY.

BY M. ALLEN, HAYS CITY.

Ladies and Gentlemen of the Kansas State Horticultural Society: Your Secretary has asked me to read a paper at this time upon the subject of "Small Fruits, including grapes and cherries, with recommendations for my locality."

By way of preface, I may say that a quarter of a century ago I had a reputation for growing strawberries in the community where I then lived. This was probably proper and right, because I had been successful in that line, but after years of experience, candor compels me to admit that I knew less about it than I supposed I did at time of gathering my first and second crops of that delicious fruit. If your Secretary had only known this, I might not have been invited here, and would most likely have been left at home—that home upon the plains around which only eighteen years ago the Cheyenne Indians were killing everyone whom they could catch—where the savans of the East with great unanimity agreed and promulgated to the world that nothing would grow; more especially that farm crops, trees, fruits, and all garden truck, would always fail. For a long time the plausibility of the argument seemed to indicate that they were right; for did we not, after driving away the Indians, have to kill the buffalo? After this our first furrow was yet to be plowed; then came seasons of drouth and grasshoppers. Upon these I need not dwell, because many of you, even from the eastern portion of this fair commonwealth, know without being told. The most troublesome thing we had to contend with, however, was public opinion. In cow-boy vernacular, it takes more "sand" to plant an apple tree when and where everybody knows it won't grow, and if it does grow, it will never bear; and if it should by accident even both grow and bear, that the wind will blow all the fruit off anyhow before it comes to maturity—yes, more sand than it takes to kill a whole troop of Indians or drive off hosts of buffalo. You will understand from these pre-

liminaries that my experience is of but short duration, and may not be considered as time-tested, even if it has come through the fire of adversity.

For small fruits generally, if not altogether, ground should be selected that is naturally very rich, or it should be made so artificially.

Level ground at the base of a steep northern slope would be an excellent place. Such a spot would not only be favorable for holding the water that fell upon it, but also for catching the water and fertility from the adjacent slope. If this slope was a hill of any great magnitude, it would also afford some protection from the south winds, which sometimes blow with such fury as to be a detriment not only to small-fruit plantations, but to fruit and forest trees, and I might add farm crops as well. I would not, however, fail to plant for want of such a place, but would plant almost anywhere, rather than not plant at all. If planting must be done upon the open plain, two or more rows may be planted on the south side for a wind-break—and for this purpose probably no surer combination can be had than Russian mulberry, wild cherry, honey locust, and hackberry. These four trees will be likely to stay and behave themselves well, even under the most unfavorable circumstances. The first two of these are named not only because they are well adapted for the purpose, but for their good timbers and for the bird feed they produce, it being deemed much better to feed the winged songsters upon the fruit of these trees than upon cherries, raspberries and blackberries that have a market value. But for limited plantations a high board or picket fence, or better still, a stone wall on the south side, is the most desirable. In short, plant your small fruits only upon rich ground; husband the moisture, and protect slightly from the south wind and hot summer sunshine.

Understand, I am not advocating the building of high board or picket fences or stone walls for the purpose of protecting fruit plantations from the south wind or summer sunshine, but when such structures already exist, their north side will be found a favorable place for the small fruits in limited quantity or for family use.

Upon a small scale, mulching may be quite desirable—occasionally moving the material and stirring the ground with hoe or mattock; but for more extensive plantations, nothing will compensate for persistent and continuous cultivation during the growing season with hoe and shovel plow.

Strawberries should be planted in early spring, in rows four feet apart, and if one to two feet apart in the row and well cared for, the rows should be well filled with plants by fall of the first year; just before winter sets in they should be slightly covered with some light substance, to prevent rapid and successive freezing and thawing. I have used asparagus tops from an adjoining bed with good success; this covering should be taken off in spring, and if from time of blooming until maturity of fruit, plenty of water could be supplied by some artificial means, a heavy crop could be relied upon almost without fail.

Raspberries and blackberries can probably be planted in fall to best advantage if the ground be sufficiently moist at that time. Plant in a shallow furrow, and cover each plant with two or three shovelfuls of well-rotted manure. This will be mixed and incorporated with the soil in subsequent cultivation, and leave the stock somewhat deep in the ground when leveled, as it should be. The rows should be six to eight feet apart, and the plants half as far in the row, and if they are planted so as to be cultivated both ways with the shovel plow for the first year or two, all the better. The bushes should be kept low by pinching off ends of young canes at one to two feet in height.

Of grapes I know but little. I probably don't deserve a bunch of this fruit, having allowed my vines to go unpruned, and to fight their own battles with sunflowers and other weeds. Yet even with this slovenly culture, or rather want of all culture, I get some grapes, and for this year the fruit seems to be quite plenty. A long,

lank, grayish crooked worm ate much of the foliage from some of my vines for two or three years. This was one cause of so much neglect, believing as I did, that these worms would finally destroy the vines; but I at last settled with the worms quite effectually with a dose of Paris green. If I had nothing else to do, I would plant grapes quite liberally; I would plow deep; manure well; give them plenty of room; clean culture, and train low—if upon vine trellis not more than two or three feet high, with rows north and south. In this way, I have no doubt but better results can be obtained with the grape in my locality than with any of the fruits yet named in this paper. Of cherries I have had four good crops, and no failure. The best results are obtained from Early Richmond grafted on Morello stock; such trees are objected to by some because they sprout.

Young trees on their own roots do not bear much, nor do they bear quite so young upon the Mahaleb stock. Trees may be planted at one or two years old from bud or graft, in rows twelve to eighteen feet apart, and half this distance in the row. They should be headed low, with the lowest limb of the head on the south side; the ground should be cultivated in some hoed crop until the trees begin to bear; after one good crop of fruit the ground ought to be well manured about once in two years, with enough cultivation to keep weeds in subjection. In this way nice plump fruit will be obtained, and plenty of it. I have several sorts on trial, but thus far the fruit comes from Early Richmond and common Morello, even the famed English Morello proving unproductive with me; this year, while blooming very full, it was cut off by late frost.

60.73 I have one tree of Early Richmond, grafted at the ground in 1878; in 1883 it produced 15 quarts; in 1884, 23 quarts; in 1885, 20 quarts; and in 1886, 36 quarts. They sold respectively at 25 cents per quart, 20 cents, 15 cents, and 15 cents, making the sum of \$16.75 as the product of this single tree.

At this juncture the question may be asked, why have you not thousands of such trees, and why are they not upon every farm and in all the dooryards of your county? To which I will answer, that as late as September, 1872, several people of my county were killed by Indians, and that a member of my own family was confronted by hostile braves a year later; and I will submit to you, gentlemen, that raising trees and raising scalps do not go well together, at least not upon the same quarter-section.

Adjourned to 2 o'clock P. M.

AFTERNOON SESSION.

WEDNESDAY, December 8, 1886.

President Johnson in the chair. The following report was announced in regular order:

SMALL FRUITS: THEIR BEHAVIOR IN 1886.

BY B. F. SMITH, LAWRENCE.

For seven years I have been experimenting and testing varieties in Kansas, to find out their behavior, and to ascertain to a certainty those that would reward the cultivator in a commercial sense. Beginning by planting five acres of the famous old Wilson, in 1880, I soon found that its behavior was such that to continue its culture would be a serious loss at every trial. I am still carrying it for the sake of its old friends. I have twelve varieties on my grounds that are more profitable to grow for commerce.

Small fruits grow better in behavior as we learn how to care for them, and learn which varieties are suited to our soil, and our so often variable seasons. We must

learn how to keep them alive in a dry season, and how to keep the weeds from smothering them in a wet season. When this fact is learned, small fruits in behavior in Kansas will compare favorably with some of the older States.

The small-fruit trade is now becoming quite a factor in the business of our young cities and towns, in their fruiting season. In our own city—Lawrence—grocery-men tell me that their profits are larger during the small-fruit season than in any other part of the year, so they are just as anxious for their good behavior as the berry-growers themselves. Then the large berry shipper is even more anxious for a large crop of berries, as it is the profit thereon from which he realizes the largest share of his living.

With the above reflections, I will proceed to tell you about the behavior of between fifty and sixty varieties that fruited on my grounds in 1886.

The Atlantic.—Originated as it was, on the sandy plains of New Jersey, I had but little faith in its standing our seasons; yet I ventured in a purchase of fifty plants in the spring of 1884; hence have fruited it two seasons. The Atlantic is as firm as the Capt. Jack, and equal to it in product. Its berries are a dark, glossy red, and rather longer than the Capt. Jack. It is even later than the Glendale. The Crescents are nearly half gone when it begins to ripen. Though not as strong a grower as the Crescent or Capt. Jack, it stood the drouth of this season extremely well.

Bidwell.—Have fruited this variety four years. Its product this year is about equal to the other seasons. It is a large, finely-flavored berry, but it is not profitable to grow on my grounds.

Capt. Jack.—After fruiting this variety seven years, I must say that its behavior is always the same. It will produce a profitable crop of berries with careless culture, but with high culture, its berries are very large; and as a fertilizer for the Crescent, there is none better.

Chas. Downing.—If this grand old strawberry would always do as well as it has this year, new laurels might be added to it; but it has a choice in seasons. In the season of 1885 its product was not half what it was this season. Then again, some seasons two or three-year-old beds will produce double the crop of one-year-old beds that have had the best of culture. In size, the Downing is large enough for any purpose, and in taste it pleases everybody.

Crescent.—This is now the leading standard strawberry throughout the country. Its product on my grounds, this year, was fully equal to former seasons. The immense product of this variety is what has greatly reduced prices in the markets throughout our country. The last half of the crop this year grew very soft, and unfit for shipping, which I attributed to the hot weather toward the close of the berry season. In our Lawrence market, the Crescent brought the lowest prices, while the Miner and Windsor Chief brought the highest.

Connecticut Queen.—This variety is as good as gold, and it has won friends wherever it has had a fair trial. As a plant to stand the dry weather, it is as hardy as any variety on my grounds. In plant growth and foliage, it is of the Downing type. The only hindrance to its becoming a great favorite is its color. When thoroughly ripe it is a dull brick-red. Before the berries turn red, they are a buff color, and of good flavor before fully ripe. After the second year's fruiting this variety, I am so well pleased that I shall extend its borders.

Countess.—This variety, of Wisconsin origin, did better this year than last. Its berries are about the size of the Jas. Vick—a bright, glossy, pale red, and firm. The plant is a strong grower, and while it is productive enough to pay the cultivator, there are others that are more satisfactory.

Cornelia.—This was my first year's experience with this variety. It fully equals the claims set up for it by Mathew Crawford, its originator. It is late, large; and fine

when the Crescent is about gone. Its greatest merit is its lateness. The plant is not a strong grower, which will be a hindrance to its extended culture.

Cumberland.—In behavior this famous variety lost ground in my estimation this year. While its berries are very large and attractive, they will not bear shipping outside of a home market. Then in productiveness, there are a number of others that will double it.

Finch.—Have fruited it three years, and while it is a handsome strawberry, of fine flavor, I am convinced after this year's trial, that there are many others more valuable to grow for profit.

Glendale.—After five years' fruiting this variety, I find in it nothing to condemn, except its flavor. In taste it might well be called a third-rate berry. The plant is a strong grower, and its fruit will average larger than the Crescent. The Glendale is one of the best fertilizers for the Windsor Chief, as both bloom at the same time.

Indiana.—This year this variety more than doubled last year's product. Its berries are a little tender, but of fine flavor. It is a seedling of the Chas. Downing, but not as large. It is no improvement on that variety, as was claimed by its originator, E. Y. Teas, of Indiana.

Jas. Vick.—The past two years the Vick has been a disappointment. The first year it fruited (1884) it was a grand success. I have late advice from parties in Newton county that their product was larger this year than the product of an equal number of Crescents, set out at the same time. This patch was planted on the Arkansas river bottom land. A member of our Douglas county horticultural society told me recently that his patch of Vicks gave him a larger crop than the Crescent on his Kansas river bottom, sandy soil.

Jersey Queen.—This variety behaved badly this year. Last year its product was about equal to the Capt. Jack, but like the Downing, it is choice in its seasons. If the season suits, it will reward the cultivator. In taste it is equal to the Cumberland or Sharpless. The plant is a strong grower, berries very large and late.

Jumbo.—To all appearances of both plant and fruit it is the Cumberland.

Kentucky.—In this variety the varying seasons do not appear to diminish or increase its product. In plant, growth, and foliage it is much like the Downing; but its berries are more tender, and of lighter shade. It is said to be later than the Downing, but I have not been able to observe much difference in time of ripening.

Lacon.—This was my first year's experience with this variety, and from the reports I had read in Eastern papers, did not expect much from it, but I was agreeably disappointed. Its fruit is about as large as the Crescent, light scarlet, fine flavor, and in product entirely satisfactory. It does not produce a heavy crop of plants. From four to six plants will set near the parent in a season, which become large, and more inclined to grow in hills than any variety I ever raised. To a cultivator who despises an overflowing plant growth, I would advise a trial of the Lacon.

Manchester.—Has not, after a three years' fruiting, been a success with me. It has had an equal chance with other sorts, but its product is no comparison to the Crescent, Miner, Windsor Chief, Capt. Jack, or Glendale. To my taste it is poor in quality.

May King.—This being my first year's experience with this variety, I cannot compare its behavior with other seasons, but will say I was much pleased with its berries, and hardness of plant in standing firm against the intense heat and drouth of this year. To my taste this is the best strawberry I ever raised. The berries of the May King are a beautiful bright scarlet, and about the size of the Chas. Downing.

Miner's Prolific.—This is my fourth year's experience in fruiting this famous strawberry, and while it has always pleased me in product, the fine appearance of its

berries this year surpassed all other seasons. The fruit is attractive on the vines, but when gathered into boxes and put on the market stand, then it is most attractive. It has been more admired on account of its great size and rich color than any strawberry ever put on the Lawrence market. In the East it is said to color on one side only while the other is green, but the genial sunshine of Kansas brings out its color to perfection.

Mt. Vernon.—After the fourth season's fruiting my desire to continue its cultivation is strengthened. It is about as late as the Windsor Chief, and equal to the Capt. Jack in product. The fruit is large and among the best to eat, but it is too tender to ship.

Old Iron-Clad.—This variety in plant growth is strong and hardy, but in fruit, as compared with many other sorts, it does not satisfy me.

Parry.—The behavior of this new strawberry surprised me in its great size, quality and firmness. Having read some bad reports from near the home of the Parry, I was not anticipating such results. In all my twenty years' experience in berry culture, it surpassed all others in size, from the beginning to the closing of the berry season. Its color, in comparison to the May King, which grew in the next bed, was a purplish red. One of my berry pickers called it the purple strawberry bed. The plant has not stood the drouth of this season as well as some other varieties, but it has stood the heat better than the Sharpless.

Piper.—This variety did much better this year than it did last season. Its fruit is the darkest red of any strawberry I grow. In taste it ranks high. In size, berries are medium. The plant is hardy, but in product it falls below several others on my list.

Prince of Berries.—In behavior was better than last year, but this, its second and best season, is not satisfactory proof to me that it will pay to grow, save as a novelty.

Sucker State.—This variety is a strong grower; berries much like the Cumberland in color and shape, but they are as firm as the Wilson or Captain Jack. In product it hardly equals the Miner. It being late, and firm, will doubtless make it a favorite for shipping.

Sharpless.—This kingly strawberry is no longer the king on my grounds—the Parry having scooped it in size this year. It is wanting in vitality to resist heat and dry weather. Previous to this year it made a strong plant growth, but the output even on new beds set out last spring was very feeble. The fruit is very fine in some localities in the East, but here it is too scattering to be profitable. It is claimed by some growers that the Sharpless is one of the best of staminate for the Crescent, which, from experience, I admit. But who can afford to carry a few dead-head strawberry plants for staminate when there are a number of fruitful staminate that will answer as well?

Windsor Chief.—This strawberry alphabetically arranged in this paper is the last, out it is by no means the least. Its product this season was the equal of the Crescent, which was about half gone when the Windsor began to ripen. My latest pickings this year were from my Windsor beds. The berries are large, and continue well up in size to the close of the season. In flavor they are not the equal of the Miner, but they are better than the Crescent. As to firmness, they are above medium. In the Lawrence market it brought me 75 cents to \$1 per crate more than the Crescent. This is the fourth year that I have fruited it, and was the only season it ever equaled the Crescent in product. However, like the Downing, it is choice in its season, and high culture is more sure to secure a large product.

BEHAVIOR OF RASPBERRIES IN 1886.

Brandywine.—This is one of our most hardy red raspberries. Its behavior this year was about equal to other seasons. The latter half of its pickings were cut short by the drouth, which commenced in July. The bush is a medium grower. The fruit is a shade darker than the Thwack, but it is not so firm as the Thwack, but firmer than the Turner.

Cuthbert.—My Cuthberts stood the intense cold of last winter better than the previous winter. This is a famous red raspberry when it stands the racks of our severe winters. It is larger than any other variety, except the Marlboro. Were I limited to one variety of reds, the Cuthbert would be my choice for home supply, if it was always hardy. It has been seriously damaged two winters by cold weather on my grounds.

Caroline.—This handsome yellow raspberry did well this year, even better than last. It is a real gem, and pleases all who see it. In growth of bush it is about equal to the Brandywine. Its fruit is hardly an orange, but more of a buff color, with a pinkish tint when fully ripe.

Crimson Beauty.—This variety failed in the product of its berries. The few that matured were very fine, but tender. There are a half-dozen other reds that give much better results.

Gregg.—This, the largest of all the cap family, gave me more satisfaction than it did last year, when my entire crop was killed; but this year my one and two-year-old beds were not injured in the least, though the three-year beds were seriously damaged.

Hansell.—This handsome red raspberry was partially injured by the cold. The advantage this variety has over the Brandywine is in its early ripening, being a week earlier. Its berries are a beautiful bright scarlet. The Hansell is firmer than the Turner, but not as pleasant to the taste.

Hopkins.—On account of its extreme hardness, this western Missouri blackcap is growing favorably. It was first brought to notice by G. W. Hopkins, and on the suggestion of Mr. Frank Holsinger, of Rosedale, it was called Hopkins. Coming into existence as it did here on the very borders of the plains, it was assumed that it would stand all sorts of seasons, and it has on my grounds stood the storms better than any other blackcap. In fact, the Hopkins has never been known to be injured by cold weather, or drying winds, or drouth, so much but what it was ready at the harvesting season to reward the grower with a profitable crop of berries.

McCormick.—This old, well-known variety has been seriously injured by cold weather three successive seasons, and unless it does better very soon than it has the past three years, I shall drop it from my list.

Marlboro.—Two years ago this fall I paid \$9 per 100 for 200 plants of this variety. Having planted them in the spring of 1885, they fruited first this year. Although it was slightly damaged by the cold weather, I was much pleased with the fruit. Its berries are larger than any of the ten reds in my collection. They are a beautiful bright scarlet, and to my taste very good. It continues longer in fruiting than any other variety, beginning to ripen about the time of the Hansell. Its fruiting season this year lacked three days of being five weeks in length. The bush is as hardy as any other of the reds, except Brandywine and Thwack.

Reliance.—In the behavior of this variety this year, I was much pleased. Four rows eight rods long, at its best picking, 26th day of June, gave me four crates, (96 quarts) of berries. This is the largest yield at one picking, on an equal area of ground, of any raspberry I ever raised. This berry is dark red, about the color of the old Philadelphia, but somewhat larger than that variety. Last year, from some

unknown cause, it did poorly. In taste it is only second rate: does not remain long in bearing, like the Thwack and Marlboro, but about six pickings close its season. The only hindrance to its becoming a great market berry is its dull red color, and the tendency of its berries to crumble towards the close of the season.

Shaffer's Colossal.—This comparatively new variety is much esteemed in the East, judging by the reports. The bush is the strongest grower of any raspberry on my grounds; but it is not perfectly hardy. It was considerably injured by the last two cold winters; but with all its damage its product was entirely satisfactory. The fruit is a purple red, and very large, but too tender for extensive trade outside of a home market. The first half of the Shaffer's fruiting season, its berries might be shipped in fair order from fifty to one hundred miles. To my taste, the Shaffer is flat when gathered from the bushes, but when canned and preserved it is more palatable.

Souhegan.—After the third year's fruiting, I find in it nothing to condemn. It is perfectly hardy, and a much stronger grower than the old McCormick or Smith's Iron-Clad. This year I had two pickings of Souhegans before strawberries were gone; hence the interval that formerly existed between the strawberry and raspberry seasons is well filled by the Souhegan. In about ten days from its first picking its berries are out of the way of later kinds. On account of its extreme hardness and productiveness it will prove a valuable acquisition to the small-fruit growers.

Superb.—This raspberry, like the Reliance, is of the old Philadelphia type, of too dark a red to be attractive. Its fruit is as large as the Shaffer, but its berries crumble in picking, and present an unsalable appearance on the market stand. The bush is not a strong grower, hence will not attain to much notoriety anywhere.

Smith's Iron-Clad.—There is only one thing to condemn in this well-known raspberry: it is not hardy enough to fully stand our extremely cold winters. Unless it returns better crops very soon, more hardy sorts, like the Hopkins and Souhegan, will take its place.

Thwack.—After fruiting this praiseworthy raspberry five years, I am satisfied it deserves more mention and a better name. If our State Society has the power to change or re-name a fruit, I would suggest that it be called the "*Missouri Queen*," as it was originated at Louisiana, Missouri. It is scarcely known outside of Missouri and Kansas, and I am sure that our horticultural friends in Missouri would unite with us heartily in making the change. The Thwack is really a queenly raspberry. It is not as large as the Shaffer or Marlboro, but its fruit is such a rich red, and so firm, that it only needs to be seen to be admired. The Thwack is equally as firm as the firmest blackcap raspberry. One of our Lawrence grocerymen sold all my Thwacks, except a few I shipped to Denver. He told me he had standing orders for all the Thwacks I sold him. Not many of his customers could remember its name, he said, but they wanted that red raspberry that stood up so well. There is no shrinkage in the Thwack; if a box is well filled it will remain full at least forty-eight hours. My commission merchant in Denver wrote me that my Thwacks arrived in No. 1 order, and while Colorado strawberries were still plenty in Denver, the Thwack sold for \$5 per crate. The bush is not as strong a grower as the Turner; but in five successive years it has doubled that famous old variety in money product on my grounds. And here indulge me a little further to say: in my opinion, if this raspberry had been well named, and introduced as new fruits are now introduced in the East, it would have been the leading red raspberry for commerce East and West.

BLACKBERRIES.

Early Harvest.—This blackberry made a poor showing in fruit this year. In fact, its bad behavior is a certainty where a berry season is preceded by sudden blizzards and very cold weather. When the season is favorable, the Early Harvest is

productive enough for an early blackberry. Were it not frequently winter-killed, it would doubtless be extensively grown, and, ripening as it does, along with the later raspberries, one or the other, or both, would suffer the possibility of low prices.

Kittatinny.—I have no complaint to make about this variety this year. While its crop of berries was seriously lessened by the drouth in July, it was no fault of the plant, as there was a large crop of fruit set. In a run of a series of years, however, it has not given satisfaction to the cultivators of Douglas county. When the seasons are favorable, the Kittatinny is still our best blackberry.

Snyder.—As usual, the Snyder set an abundant crop of berries, but for want of seasonable rains the crop of berries failed in maturing. It invariably sets more fruit than the bush can mature, unless it rains about every three days. It should be severely cut back in the spring, say at least a third of its cane and lateral growth. Then, with a reasonable degree of moisture, it will mature its crop well, and produce a good cane growth for the following season. The Snyder is perfectly hardy, and while it is not my ideal blackberry, it is the surest cropper.

Taylor.—This was my first year's experience in fruiting this blackberry. In bush growth it is hardly as strong as the Snyder. In one year's fruiting I could not decide fully as to its fruitfulness, but this year it was about equal to the Snyder.

Brunton's Early.—This blackberry is of no value in this country. It has been killed four successive years on my grounds.

Early Cluster was entirely winter-killed; hence further report as to growth of cane is of no avail.

NEW UNTRIED SMALL FRUITS, PLANTED IN SPRING OF 1886.

Jewell Strawberry.—In this new strawberry of Connecticut origin, the promise of a strong growth in a dry season is not very flattering. In fact, on my grounds it made a feeble growth. Hence, judging from its weak plant growth in our soil, it is safe to say that its product of fruit will be correspondingly small, though its berries may be large.

Bubach Strawberry.—In this new strawberry, of Illinois origin, there is more encouragement, as it has made a large plant growth, and in all the hot dry weather it continued running and setting plants. Hence its hardiness in plant growth is assured.

The Golden Queen Raspberry.—In growth of plant it shows plainly its kinship to the Cuthbert, of which it is a seedling; and in its continuing to grow through all our dry weather this year, is a sure indication that it will stand drouth. As to whether it will stand cold or not, we cannot judge, but from present indications it will have a good opportunity before the present winter closes.

I have other novelties on my grounds that will fruit the first time next year, but time forbids a further mention of them. However, before closing allow me to say that I greatly delight in testing new fruits. Higher development in all the small fruits is what I am earnestly looking for; hence, while I have opportunity and endurance, shall continue testing new fruits of Eastern origin, while at the same time trying to produce some that will be of Kansas origin.

DISCUSSION.

B. F. SMITH, answering to questions, said: I have not noticed any material effect on the fruit of the Crescent from fertilization by the Sharpless.

RASPBERRY TREATMENT.

J. W. ROBISON, Towanda: I would recommend the cutting out of one-third of the canes of the red raspberry, and the cutting back of one-third the length of canes in the spring.

C. H. LOVEJOY, Lawrence: This year I mulched a portion of my canes and thinned them out. The fruit on these was large, while on the portion not so treated the product was not near as good.

F. HOLSINGER, Rosedale: The Hopkins was first brought into notice by G. W. Hopkins, near Kansas City. It was found in the forests with a large number of other plants, and when they fruited, this one was selected as the most profitable, and propagated.

Discussion closed, and the following subject taken up.

BEST STOCKS AND BEST METHODS OF PROPAGATING.

DISCUSSION.

A. C. GRIESA, Lawrence: Nurserymen generally prefer seedling stocks, because they are most easily obtained. For the cherry the Mahaleb is used, because there is no tendency to sprout from its roots. It is as hardy as any class. The Morello stock is scarce and hard to get. For plum the peach stock is used, because of sprouting of the plum stock.

J. W. BYRAM, Cedar Point: I can see no difference in the hardness of the peach and plum stock. The imported class of pear stocks are less liable to blight. I can see no difference in cions from bearing or non-bearing trees, in productiveness.

J. G. SAMPSON, Derby: Fourteen years ago I planted a lot of Early Richmond cherries on Morello stocks. They are healthy and fruitful, while those on the Mahaleb stocks are largely dead. My budded trees seem to be most healthy.

I. A. CLEVELAND, Madison: I would advise all planters to propagate and grow their trees. Then they will know just what they are growing. I have used the suckers from pear trees for propagation, and they make good trees for orchards.

C. H. LOVEJOY, Vinland: I have used what are called water sprouts for grafts; such have made fine trees. There is complaint of cherry trees dying in many places. I have them on their own roots which are twenty years old, and healthy.

J. W. BYRAM, Cedar Point: Morello stock is the hadiest and best, because Mahaleb and Mazzard stocks do not furnish early fruiting.

D. G. GIESWOLD, Burlingame: The Early Richmond cherry on its own root will be long-lived, while those worked on the Mahaleb will be short-lived.

WM. CUTTER, Junction City: I have them on their own roots, and they never bear.

J. W. ROBISON: Such trees make most rapid growth, hence are not early bearers. We have many seedling apricots in Butler county which are desirable; are not Russian, but are hardy and the fruit good. The Miner plum grafted on other stocks bears early. The majority of seedling stocks are tender, hence it is an advantage to work them in short sections, as such process will give more of the kind used in working, and which generally is hardy.

Discussion closed.

The President announced a paper on the subject of

NEEDED LEGISLATION TO SUPPRESS INSECT DEPREDATIONS.

BY A. N. GODFREY, MADISON.

The successful culture of trees and plants has become a closely contested battle against insects. From the seed, through all their stages of growth to the seed again, plants are subject to their attacks.

Entomology, when considered in its true relation to agriculture and horticulture, becomes a subject of vital importance—a question of profit and loss, of success or failure, of *dollars and cents*. Very few persons realize the immense loss annually caused by insect depredations. Every crop in our orchards, gardens or farms is

more or less subject to their ravages. Every year, upon every farm, are to be seen instances in which promising prospects are changed by them into partial or complete failures. How often do we find an apple orchard in spring, white with the fragrant promise of a bountiful crop, stripped and blackened in a few short weeks by the canker-worm.

Gardening has become a battle against insects, just as much as it ever was a war against weeds. In some parts of the State it has become nearly impossible to raise a good crop of wheat on account of the chinch bug, and many of our farmers have advocated the necessity of a law to prohibit the sowing of small grain for a few years, in order to check their increase. Many fields of small grain are left uncut each year on account of this pest, while the corn crop is reduced by it to the extent of millions of bushels annually. These are stubborn facts, of which you have all seen abundant evidence, yet it is difficult to figure our losses in dollars and cents. I will venture the assertion that every man present has lost ten dollars from insect depredations during the past year; many have lost one hundred dollars, while not a few have experienced a loss of five hundred. Many estimates have been made of these annual losses, but they generally fall far short of the true amount. The late Horace Greeley said: "If I were to estimate the average loss per annum to the farmers of this country from insects at \$100,000,000, I should doubtless be far below the mark." And doubtless he would. Thomas, in his *American Fruit Culturist*, estimates the injury from the curculio alone at one million dollars annually. Prof. C. V. Riley made a careful investigation of the injury caused by the chinch bug in Missouri in 1874. From the reports received he estimated the loss at *nineteen million dollars*. Think a moment—this immense loss was occasioned by this one species of insect, in *one State in one year!* This statement would be almost incredible were it not for the absolutely trustworthy source from which it came. I sincerely believe that the farmers and fruit-growers of Kansas are robbed every year by insect pests to the amount of twenty millions of dollars at the very least, which would otherwise go to increase the general wealth of the State.

We might endure even this immense loss with resignation, were it not for the alarming fact that it is becoming greater from year to year. Our cultivated area is increasing rapidly, and creating new worlds for the insect foes to conquer. Several serious pests are spreading, and are to be found each year where they never appeared before.

While nearly every tiller of the soil is fully aware of his losses, there is now throughout the State a "masterly inactivity" in the work of keeping our insect foes in check, that is surprising. This results chiefly from a lack of knowledge of the habits of insects and of the proper means of fighting them. The great majority are ready and willing to work, if they but knew what to do and how to do it. The agricultural class needs a more thorough knowledge of practical entomology. A simple text-book on the subject should be introduced into our common schools, giving an outline of the classification of insects, the general character and habits of the different classes, and their practical relation to our growing crops, with suggestions in regard to the best means of combatting the injurious species. Entomology offers to the young mind a subject of deep and absorbing interest. It satisfies the natural craving for the marvelous and beautiful, and affords healthful themes for thought and study. It encourages and develops the faculty of observation, which enables the student to see and comprehend the natural world with which he is thrown in contact. As a common-school study, it would be one of the most attractive and useful of any of the natural sciences.

While this step would lay the foundation for more intelligent action in the future, our present necessities demand more prompt and decided action. We need, and by

rights ought to have, a State entomologist. His duties should be to study the practical relation of insects to our field, orchard, and garden crops. He should travel, and investigate any serious insect plague that appears. He should conduct experiments to ascertain the best and most practical methods of fighting each injurious species. He should report the result of his observations and experience to the people, through the channel that will most directly reach them. He should receive a salary sufficient to enable him to devote his entire time to the subject, and to defray the necessary expenses of travel and experiments. His usefulness will in a great degree be proportionate to his salary. Better a dummy from a dry-goods store to fill the position, than an earnest worker with an insufficient salary. In Kansas, the home of insects, a State entomologist would not find his time hanging idly on his hands. His field of labor, extending over the entire State, would furnish constant employment for hand and brain throughout the year. Few farmers or fruit-growers have time to study and experiment on their insect enemies. We need, and must have, a man to do this work for us. Perhaps some Solon will ask, "What can one man do against the vast hordes of insect enemies? Can he kill them all?" We answer, no; if a standing army of a thousand men could accomplish this desirable result, we could well afford to support it for a hundred years. The State entomologist would be a sort of commander-in-chief of a large army of home guards, each member of which would fight well, because fighting at home and for his own interests. The commander, instead of arming himself with a little brief authority and a butterfly net, and setting out on a war of extermination against the insect foes, would go quietly to work studying their weak points, the best plan of attack, the most improved implements of warfare, and could then issue intelligent instructions to his army in the field.

Little can ever be accomplished until the people are taught the necessity of acting promptly at the right time and in concert. To gain the victory there must be fighting *all along the line*. There will never be concert of action in this matter until we have a State entomologist to teach us when and how to act, and the *necessity* of action. The agricultural and horticultural interests of Kansas far exceed any others in importance, and when these interests are threatened they should receive prompt and efficient aid. We are all interested in this subject, whether it be the farmer who raises wheat for the chinch bug, the gardener who grows cabbages as food for the worms, or the orchardist whose products are apples honey-combed by the codling moth. Let each man, therefore, be a committee of one to urge on his Senator or Representative the necessity of creating the office of State entomologist. Other States have created the office and supported it for years with gratifying results. Why cannot Kansas recognize her vital interests in like manner? No other State in the Union needs the office more than our own. The labors of a State entomologist would save to the State millions of dollars, beside which sum a fair salary of one official seems insignificant indeed. Not one of our law-makers would hesitate to invest three or four thousand dollars on a reasonable assurance of gaining a million or two. Why can they not make such an investment for the State?

When the live-stock interest was threatened by contagious diseases, it received efficient aid by the creation of the office of State veterinary surgeon and the appointment of a commission, whose labors cost the State much more than the salary of the office which we demand. Our interests are much greater than those of the stock-men, and should receive an equal recognition. Let us impress our legislators with the importance of this matter; let us petition, let us *demand* that our interests be recognized. We want the study of entomology introduced in our schools, and we *must have* a State entomologist.

On motion, the paper was referred to Committee on Needed Legislation.

The report of the Committee on Experimental Work in Horticulture at the Agricultural College, by Prof. E. A. Popenoe, of the Agricultural College, was read, and will be found in the appendix, in the department of "Reports of Standing Committees."

The annual report of the Treasurer was read, and on motion it was referred to the Auditing Committee.

SECRETARY'S ANNUAL REPORT.

Mr. President, and Members: I here present to you a summary report of some of the prominent features of Kansas horticulture for the year now closing, and the work of your Board and Secretary since our last annual meeting.

The results of the year, while in many points peculiar, have not, I judge from the reports of the Society's County Vice Presidents, caused any material discouragement, or lessened the abounding confidence of our people in the resources of the State of their adoption. The early-ripening product of well-cultivated fruit grounds was fully up to an average of years past, while the later was never more promising, as late as the middle of August, for an abundant crop of fine quality. At this point the effects of one of the severest drouths which has visited our State since the year 1860, began to become apparent, and from that on until harvesting-time became more and more evident, until the flattering prospect of the fore part of the season dwindled down to an exceedingly fine thing, and most of the apple crop of the eastern half of the State found its most valuable outcome at the cider mill, being quite appropriately dubbed as "bird-shot."

One of the most curious features of the season was the reversal of the heretofore order of rainfalls as between the two sections, eastern and western Kansas. Be it known that the "dews of heaven" and its showers of rain have been sufficient on those broad and once arid plains, to make agriculture in its varied forms a success. The evidences in tree growth are of the most encouraging character, especially in localities where wiseacres have said trees could not be grown. During the latter part of the season it was my privilege to visit many portions of the west and southwest, and to witness the results of the peculiar soils which prevail in those localities. I found all classes of trees making a good growth, and apparently at home. Their healthy cast of foliage was truly gratifying, and fruit trees—apple and pear—were carrying a well-developed fruit product. Such was the case through the Arkansas valley as far out as Garden City, where the Winesap, Ben Davis, Missouri Pippin, Willow Twig and Smith's Cider were in full bearing at the age of five and six years. At Lakin, still farther west—427 miles from Kansas City, and within 40 miles of our western boundary-line—apple, peach, cherry and plum trees planted in the spring were successfully growing, and had made a better growth than many of our trees in eastern Kansas.

In the northwest are found very flattering results, both in wood growth and fruit. The most western orchard in the northwest which has come into fruiting is at Lenora, Norton county, owned by Christian Miller, and I have here to exhibit to you some of the product of that orchard, and also of the most remote in the southwest, viz., the orchard of Mr. Worrell, at Garden City. In the orchard of Mr. Miller, the trees, like those of Mr. Worrell's at Garden City, were as thrifty and healthy as can be found in any section of the State. I have here the Rawle's Genet and Newtown Pippin, samples picked from a first orchard planted in Kansas, fifty years ago, by the Rev. Thomas Johnson, at Shawnee Mission, in Johnson county. This good man, when settling among the Indians, fully recognized the elevating influences of horticulture as a refining and civilizing industry, planted trees of various kinds at the Shawnee

Mission, cared for them, and reaped his reward in the satisfaction of partaking of their fruits in the then far-off wilds of what to-day is *our* home. These trees are to-day healthy and fruitful, and afford to us the evidence of labors well done. It is to me a gratifying, happy moment, that I am able at this time to place before you specimens from the primitive orchard on our eastern border, and from the almost western border—from the first and the latest bearing orchards in this State—the two extremes; and upon the tables in the adjoining room are the evidences of the product of the territory between, and which form a continuous fruit-producing line very nearly across our State.

The finest product of a vineyard it has been my privilege to examine, was found on the grounds of D. M. Wright, at Hutchinson, Reno county. Among the varieties were found the Niagara, Lady Washington, Duchess, Noah, Salem, Norton's Virginia, Highland, Black Defiance, Jefferson, and Pocklington. The fruit was well grown, and of most excellent quality. At the Bismarck Fair this year was made an exhibit of apples, pears, grapes and plums grown at Hays City, Ellis county. Mr. Martin Allen, a prominent member of this Society, made the exhibit, and in a letter to this office, says:

"I fruited about thirty varieties of apples this season. The exhibit made at the Bismarck Fair contained of plums, samples of Lombard, Emigrant, Miner, Chickasaw, Shropshire Damsen, and five or six kinds of wild ones; of pears, Bartlett, White Doyenne, Seckel, Halloway, Father Sommenisen; grapes, Concord, Brighton, Catawba, Elvira, Norton, Isabella."

Here was the product of fruit trees and vines planted near the 100th meridian west—yea, from off the so-called barren wastes of western Kansas—"away out west," as was the common expression when ten years ago the buffalo ranged these prairies over in immense herds, and men were ridiculed for planting trees of any kind. The apples and pears were of sorts common to eastern Kansas; of plums, the Lombard and its offspring, the Emigrant, and many varieties of the Sand plum. The fruit of the first two varieties of plums was remarkably fine; especially so was the Emigrant.

This exhibit of grapes won the second premium for a collective exhibit. Among them were noticed the Catawba and Isabella, which were equal to the best product in the years of their notoriety. Size was large, bunches well formed and sound, their quality superior, and they would have been a credit to the famous vineyards of Nicholas Longworth, who first planted around Cincinnati, Ohio.

The character of apples and pears grown in the extreme western portion of the State has a peculiarly healthy and sound appearance. The color is of a soft tint, and the skin waxy and smooth. In the Arkansas valley the Winesap takes on a dark solid red, covered with a heavy bloom; the Willow Twig and Smith's Cider a brilliant scarlet; and the Grimes's Golden a clear golden yellow, while yet on the tree. The effects of that climate are very marked in the coloring of fruit.

MEETINGS OF THE BOARD.

The first was held at Manhattan, December 3, 1885, immediately following the adjournment of the nineteenth annual meeting. All the members were present, excepting President Gale.

The chairs of the several standing committees were filled for the present year, as found published in volume 15, p. v. Also, the following committees were appointed to complete the Society's fruit manual: Peach and Nectarine—H. E. Van Deman, Geneva, J. Nixon, Winfield; Pear and Cherry—G. C. Brackett, Lawrence; Plum and Apricot—Wm. Cutter, Junction City; Small Fruits (blackberry, raspberry and strawberry)—Hon. E. J. Holman, Leavenworth, Judson Williams, Ottawa; Grapes—F. Holsinger, G. F. Espenlaub, Rosedale; Currant and Gooseberry—Dr. Chas. Williamson, Washington.

The second meeting was held at Wichita, on the evening of the 28th of June. At this meeting a formal acceptance of the resignation of President Gale, dated December 24, 1885, was ordered; and the death of Vice President M. B. Newman, acting President, was formally announced. The Board then proceeded to an election to fill the vacant offices. Geo. Y. Johnson, of Lawrence, was unanimously elected to the Presidency, and Wm. Cutter, of Junction City, to the Vice-Presidency.

FRUIT CROP REPORT FOR 1886.

From carefully-prepared data, made up from reports from each of the fruit counties, I am prepared to make the following report:

SUMMARY FOR THE STATE.

Districts.	Apple.....	Cherry.....	Pear.....	Pum.....	Blackberry.	Currant.....	Gooseberry.	Raspberry.	Strawberry.	Grape.....
Northern	62½	56½	31½	50	76.2	66½	74½	82	75	79½
Central	49½	60½	40½	68	74.8	50½	56½	77½	65½	85
Southern.....	62	62½	49	64	75.25	56	53½	72	65	71
Per cent. for the State.....	58	59½	40½	60½	76.25	59½	82½	77+	68+	78+

And for other States, on apples, as follows:

Missouri.....	60 per cent.	Michigan.....	85 per cent.
Illinois.....	62 "	Nebraska.....	40 "
Iowa.....	40 "	Ohio.....	100 "
Wisconsin.....	20 "	New York.....	60 "
Indiana.....	80 "		

All States report a great reduction in the marketable product by insects and drouth. Kansas never had a better showing for an apple crop than existed on August 1st. It was not as large as in some years, but unusually fair in appearance, and healthy. Where went it? Largely to the ground prematurely, and to the cider mills. Dame Nature went all awry after that date. The tree, in a fearful struggle for life, shook off every burden which was exhausting to its energies, and the bright promise gradually disappeared.

SOCIETY'S PUBLICATIONS.

Of the Horticultural Report for 1885, 8,000 copies were printed, and of Forestry Manual, 6,000 copies, which is an increase of 2,000 copies each on former editions; and yet the demands for these reports have not been met. As the newer counties have settled, the demand for such reports, especially for the western portion of the State, has been largely increased.

HORTICULTURAL SOCIETIES IN THE STATE.

Since our last annual assembling the following societies have been organized: Meade County Horticultural Society, Hodgeman County Horticultural Society, Comanche County Horticultural Society. These were organized early in the spring, and are in good working condition. With these, there now exist in the State fifty-four horticultural societies, each reporting to this office, viz.: Seven district organizations, and forty-seven county and local.

OBITUARY NOTICES.

Again it becomes my painful duty to announce to you the removal, by death, of our highly esteemed co-laborers and warm friends, Dr. Charles Reynolds, of Junction City; Judge M. B. Newman, of Wyandotte, Vice President, and acting President at the time of his death; and Hon. C. H. Graham, of Leroy, a former member of the Board. Of these I need not say more, than that they were true and faithful friends

of the Society, and their loss is irreparable. They have gone in and out with us. They have trodden the thorny as well as the pleasant paths of duty with unfaltering step, and laid off the harness only at the portals of death.

Respectfully submitted.

On motion, the report was adopted.

REPORT OF COMMITTEE ON NOMINATIONS.

Your committee report the following names to fill the offices of the Society for the next two years: President, Geo. Y. Johnson, Lawrence; Vice President, Wm. M. Allen, Hays City; Secretary, G. C. Brackett, Lawrence; Treasurer, F. Wellhouse, Fairmount; Trustee, Northern District, Dr. Chas. Williamson, Washington.

On motion of Hon. E. J. Holman, the report was adopted, and Capt. E. P. Diehl instructed to cast the ballot of the Society for the persons named in the report, to fill the offices respectively, which was done, and the meeting adjourned to 7 o'clock P. M.

EVENING SESSION.

WEDNESDAY, December 8, 1886.

President Geo. Y. Johnson called the meeting to order. The exercises were opened with music. Following, an essay was presented, on

FLORAL AND OTHER MANIAS.

BY SAMUEL REYNOLDS, LAWRENCE.

From time immemorial the world has been afflicted with cranks and manias. These manias—or crazes, as they are often called—have developed at different times, in various ways, and on a great variety of subjects. Within our own recollection there have been manias for collecting buttons, old coins and autographs; mining manias for the precious metals; base-ball, roller-skating and roller-coasting manias; boating and horse-racing manias, carnival manias, striking manias, kleptomanias, and many others, of which but a few can be noticed in the limits of this paper.

Less than a year ago the ice palace built in St. Paul, Minnesota, caused a wonderful fever of excitement throughout that section of country. This palace was 144 feet long, 120 feet wide, and more than 100 feet high. The main tower was surrounded by an outer wall of thirty-two feet in height, with battlements and towers at the angles. The walls were two feet thick, and were laid in regular courses of blocks of ice-like stone-work, and cemented together by pouring water upon them. The corner cake of ice was laid by one of St. Paul's fashionable young ladies, and cemented with water poured from a silver pitcher. The carnival consisted in tobogganing, snow-shoe racing, "curling," and all other sports usually practiced on snow and ice. Three thousand snow-shoers were in line on the first day. An elaborate program was carried out for each day of the carnival, including curling matches, skating tournaments, trials of horse-speed on the river, polo games on the ice, and pyrotechnic displays. The craze was so intense and so general that nothing was talked about or thought of but the carnival.

During the last few years there has been a wonderful waste of midnight oil and printers' ink in the attempt to prove that Francis Bacon was William Shakespeare, and that William Shakespeare was nobody. Volumes have been written to prove that Shakespeare's works were written by Bacon, without any satisfactory evidence. Without entering into the discussion, we fail to see any commensurate good accruing to the reading public by such a great expenditure of material force and mental en-

ergy. We are therefore compelled to class this Baconian discussion as one of the crazes of the age.

I will now refer to a mania which has a more direct bearing on farmers and horticulturists, and one, which, if not soon checked, threatens serious consequences. I mean the reckless, inhuman and wholesale slaughter of our beautiful birds for the purposes of decoration. The following extract is taken from a recent number of the *N. Y. Evening Post*:

"Strange, indeed, are the caprices of fashion. Seven years have passed by, and we find the eccentricity of a woman of the town become the craze of millinery—so great and deadly a craze that State legislatures are considering bills to prevent the extinction of our song-birds, and of all birds not too large to be worn on the bonnets of women and children. Nothing more revolting to good taste can be imagined than the 'remains' of an animal, fresh from the dissection of a taxidermist, as an ornament to a woman's forehead. The very suggestion ought to excite horror and disgust as well as pity for the slaughtered songsters of the grove. But the instincts of refined taste and the promptings of humane feeling are alike crushed by the juggernaut of fashion. The appeals of naturalists and the sarcasms of the press are alike unavailing to suppress or even lessen the massacre of the innocents. The destruction goes on at a rate limited only by the number of birds within reach of the sportsmen's guns and nets. Several thousand corpses of the white curlew were delivered in New York in four months' time. They have almost disappeared from our coasts. Linnets, bluebirds, orioles, woodpeckers, snow-birds, song-sparrows, indeed everything that has feathers, and is not too large a load to be carried on one's head, is coming to the shambles of millinery. As the smaller varieties become scarce, the larger ones are taken and cut in pieces, their heads going to one style of headdress, and their wings and tails to another. But no one can tell how large a bird can be worn on a woman's head by walking on Fifth avenue. It is necessary to take a ride in a Second-avenue car to get the full effect of the prevailing fashion. There one may see on the headgear of poorer classes, and especially of colored women, every species of the feathered kingdom smaller than a prairie chicken or a canvas-back duck, and every color of the rainbow.

"The public are beginning to realize that there is danger of the total destruction of small birds to satisfy the demands of an odious trade, founded upon a worse than barbarous fashion. The barbarian carries dead animals on his person as charms against the powers of darkness, but not for the purposes of adornment. If any daring traveler had found among the bushmen of Australia or the savages of Africa, a people wearing dead humming-birds for earrings or dead rats for necklaces, the discovery would have stirred commercial and philanthropic zeal among civilized nations to supply them with suitable beads and brass ornaments to take the place of such heathenish attire. Yet the composing of a circlet for a young girl's brow from the heads of twenty bobolinks, woodpeckers, wrens, kingfishers and other decapitated beauties of the forest and the seashore—a sight beheld by a correspondent of the *Evening Post* at the Academy of Design on Tuesday—is hardly to be distinguished in point of good taste from the wearing of humming-birds as pendants to the ear or small rodents to adorn the neck. In this case it is evident that the object was to get as many different insignia of bird slaughter crowded into one place as possible."

The October report of the Agricultural Department at Washington contained the following statement: "Potatoes are rotting furiously, and more insect pests than usual have invaded them this season. This is probably because the birds have mostly been killed off to adorn ladies' hats."

Man, who is considered lord of the soil and "monarch of all he surveys," is not, after all his boasted superiority, that independent and self-sustaining being which he so often considers himself. Not only is he dependent upon the action of the elements for his subsistence, but birds and insects are alike necessary, not only to his well-being, but to his very existence. If left to himself he would soon be deprived of the varied beauties and rich bounties of earth's wonderful productions.

Botanists tell us that without the fertilizing and hybridizing activities of the insect in carrying pollen from flower to flower, plant to plant, and tree to tree, that wonderful variety that now beautifies and enriches the earth, and that is so necessary the comfort and enjoyment of man, would soon disappear, and monotony, isolation, and finally desolation, takes its place.

Again, naturalists tell us that if all the birds were destroyed from off the face of the earth, insects would become so numerous and so destructive to vegetation, that in a short time man would have nothing left on which to subsist.

If these propositions be true, it follows that the only way to keep the insect world in check and within the sphere of its prescribed usefulness is to encourage the presence and increase of the feathered tribe. Whatever means may be used by man to destroy noxious insects or lessen their depredations can only be auxiliary to the work of the insectivorous birds. If the destruction of useful birds should cease, insects would be kept within their prescribed sphere of action, and the balance between the two orders of creatures would be adjusted according to ordained natural or physical law. If this balance between insects and birds is recklessly disturbed by the indiscriminate slaughter of the latter, no power that man can exert can balance and prevent the destruction of our fruits and vegetables. Nature, if undisturbed in her operations, never makes mistakes. To the birds and the birds alone can we look for immunity from insect ravages. In countries where the woods, trees and hedges abound with birds, apples are seldom stung with the codlin moth, nor often punctured by the tree cricket, nor is the tree ever girdled and killed by the borer.

Without entering into a discussion of the merits and demerits of different varieties of birds and their comparative usefulness, I will state that a single wren has been known to carry 300 caterpillars to her nest in a single day, and a pair of sparrows (that much-abused bird) 600 insects in the same time.

For the birds there seems to be division of labor ordained. For instance, the swallow, swift and nightingale are the guardians of the atmosphere, catching insects on the wing; woodpeckers, creepers and chickadees protect the trunks of trees; warblers and flycatchers protect the foliage; blackbirds, crows, thrushes and larks protect the surface of the soil; and snipe and woodcock protect the soil under the surface.

Apart from any human considerations, the protection of the birds comes to us a matter of self-preservation. He who wantonly destroys those innocent and useful little aerial beauties, should be confined in some prison, or transported to some arid desert and fed on the canker worm, codlin moth, tree cricket, web worm, and apple-tree borer, with a bountiful supply of American caterpillar for dessert.

What can this Society do to stop this wholesale slaughter of the innocents for the purpose of decorating ladies' hats and bonnets? It can warn the ladies of the inhumanity and the injurious consequences of the traffic. It can enter its protest against, and set its seal of condemnation on the whole business. It can publish its execration of the worse than barbarous practice of killing off our beautiful little songsters to decorate the headgear of (it may be) empty-headed women whose only beauty lies in their fine feathers. In my opinion, no true lady will patronize this traffic after she is advised of its nature and its consequences.

The many recent strikes, by wage-workers, in the various departments of industry, seems to partake of the nature of a craze or mania, becoming epidemic among tens of thousands of our working-people. A wag was heard to say the other day: "It strikes me that we shall soon hear of striking pugilists, striking blacksmiths and striking school marms."

Farmers and horticulturists are not exempt from this malady. It often happens that some farmer succeeds in growing a large and profitable crop of some particular kind when the price of that article is pretty well up in the market, when lo! almost every other farmer cognizant of the fact becomes excited, plants an increased acreage of the same kind, and continues the practice until the article becomes a drug in the market, and falls below the cost of production.

As a result of the craze for strawberry-growing, last year the Chicago market was so overstocked with this fruit that many car lots were sold for less than the freight charges. Some of the growers of large plantations had to mortgage their farms to

meet the expenses of picking and handling. I am credibly informed that the foreclosure and sale of some of these farms will be the result.

Another recent craze is on a certain family of flowers known as orchids, which are represented by two classes, viz., terrestrial and epiphytal. Plants of the former class grow in the soil in the ordinary way, while those of the latter (often called air plants) cling to the bark of trees by their thick-matted roots. They are not parasites, as they do not live on the juices of the tree, to which they fasten themselves, but on the moisture in the atmosphere. The craze for this flower has extended far and wide, both here and in Europe. A wealthy lady in New York city invested the large sum of \$250,000 in these flowers, a gentleman in Rochester \$10,000, and many others paid large sums for specimens of the same flower. Such extravagant prices can only be accounted for by the desire to obtain that which is difficult to find, and to follow in the wake of some fanciful leader who has more money than brains.

Among the flowers the chrysanthemum craze is the latest. The displays of this flower in the Eastern cities for the last two seasons were without a parallel. Within the last three years the varieties of this flower have been increased from 25 to almost or quite 1,000; and still the craze continues for more seedlings. While all improvements and advances in floriculture as well as in all other departments of horticulture are to be commended, there may be danger of sacrificing beauty and merit for diversity and variety. In this craze, as in other manias, the practice seems to be to follow the fashions in the wildest extremes at whatever cost.

The propensity in poor human nature to do as everybody else does, reminds me of a flock of sheep which was once being driven across that magnificent stone bridge which spans the river Severn at the city of Gloucester, England. The foremost of this flock, taking fright at some object approaching, leaped over the parapet into the foaming tide below. In spite of all efforts to prevent the rest of the flock from following, every animal made the reckless and fatal leap, till not a sheep was left. Thousands of people have been as badly ruined, financially, by following in the wake of some reckless leader. Even the discovery of a single flower has created intense excitement, turned the heads of multitudes, and financially ruined thousands of people. It seems sad indeed that the choicest gifts of nature should through the follies of mankind bring curses instead of blessings.

Some 300 years ago the tulip created a wonderful mania in Europe. According to the historian Gesner, the tulip was introduced into Europe from Constantinople in the year 1559. After it became known to the Dutch merchants and nobility at Vienna it became a most important branch of trade in Holland, and they frequently sent to Constantinople for roots and seeds of this flower. In the year 1634, and for three years after, little else was thought of in Holland but this traffic. All madly embarked in it, from the highest to the lowest. For a time many of the traders in this bulb made themselves enormously rich. When we read of the immense sums paid for a single root, we can feel no surprise at the rapid and large fortunes which were thus made. It is on record that one wealthy merchant gave his daughter no other portion to secure an eligible match but a single root; and in Holland the plant to this day bears the name of the "marriage portion." The tulipomania became so rampant and the price in the market so great that two hogsheads of wine, four tons of beer, two lasts of wheat, four lasts of rye, two tons of butter, 1,000 pounds of cheese, four fat oxen, eight fat swine, twelve fat sheep, a complete bed and suit of clothes, and 2,500 florins, were given in exchange for a single root called the Viceroy.

This same writer tells us that as the mode of barter became inconvenient, it gave place to sales by weight. Single roots were sold for 4,400 florins. Webster defines the value of the gold florin of Hanover to be 6s. 11d. sterling, or about \$1.50 of our

money. Only think of a careful, honest, easy-going, phlegmatic Dutchman paying \$6,600 for a single tulip! Yet such was doubtless the fact. Two thousand florins was the common price paid for a root of the "Semper Augustus," and it happened once, when only two roots of this variety could be found, the one at Amsterdam and the other at Haarlem, that 4,600 florins, a new carriage and a pair of horses, with complete harness, were given for one; and for the other an exchange of twelve acres of land. Indeed, land was often parted with when cash could not be advanced for the purchase of a desired root. Houses, cattle, furniture, and even clothes, were all sacrificed to the tulipomania. In the course of four months, in this traffic, a person has been known to realize 60,000 florins, or about \$90,000. These curious bargains took place in taverns, where notaries and clerks were regularly paid for attending; and after the contracts were all completed, the traders of all ranks sat down together to a sumptuous repast. It was ascertained that the trade in one city alone, in Holland, amounted to \$6,000,000.

Many more instances of the enormous price paid for this flower might be given, but enough is already stated to show the reckless transactions made. To such an extent was this extraordinary traffic carried on that a system of stock-jobbing was introduced, and tulips which were bought and sold for more than their weight in gold often never changed hands at all. Beekman, in referring to this traffic, says: "That for a time all other merchandise and pursuits were neglected. The result was that 'Black Friday' came with its panic. The decline of the trade was as unexpected as the rise was sudden. As most of the business was done on the credit system, when settling-day came there were many defaulters—some from inability to pay through losses, and others from dishonesty. Tulip holders then wished to dispose of their merchandise really and not nominally, but found to their disappointment that the demand had greatly decreased. Prices fell, contracts were broken, and financial ruin followed. Litigation was resorted to, and the courts were so overburdened with tulip cases that they became powerless to settle the difficulties. Finally the State interposed, and issued an order invalidating the contracts, which put an end at once to the litigation, and each man had to pocket his own losses.

Many curious anecdotes are told in connection with this tulipomania period, one of which will suffice for our purpose. A suit was brought before a phlegmatic old Dutch magistrate, who was more noted for his smoking and doubting propensities than for his legal lore and his judicial acumen, and whose perpendicular measured five feet six inches and his horizontal six feet five inches. When this honorable court was ready to try the case he sent for the constable and gave him his jack-knife as a summons for the plaintiff, and his tobacco-box to bring the defendant. When the parties were brought into court the accounts were handed to His Honor for examination. After balancing them carefully in both hands, and examining all the law and the precedents bearing on the case, the learned decision of this honorable court was: "The accounts are equally balanced; the plaintiff and defendant must exchange receipts, and the constable must pay the costs."

Chardin tells us that the tulip was quite common in Persia, and when a young Persian wished to make love to a lady he presented her with one of these flowers, which, of course, was a flame-colored one, giving her to understand that he was all aglow with her beauty and burning up with love for her.

Some writers suppose that this flower is the one referred to in the sermon on the mount, which is thus mentioned: "Consider the lilies of the field, how they grow; they toil not, neither do they spin, and yet I say unto you that Solomon in all his glory was not arrayed like one of these."

Without attempting to moralize, I submit that human nature was just as erratic and as prone to evil 300 years ago as it is to-day. Those censorious souls who are

forever mourning the decadence of morality in the world, and declaring that it is going to perdition at railroad speed, should study history and be convinced of their error. There is doubtless more intelligence and integrity in the world to-day than ever before. The leaven of moral and religious influence and the progress of science have contributed mainly to this result. It is claimed, and perhaps with some show of plausibility, that the awful amount of crime of all shades and degrees recorded as the current news of the day, is a strong argument in favor of the moral decadence of the world; but we must remember that the record of crime in a given city is not the history of that city. In this age of intercommunication our news comes in an aggregated form. We get a daily epitome of the crimes of the whole civilized world. The sum we admit is vast, but then it must be distributed among hundreds of millions of inhabitants. When that division is made, we shall find the unit pro rata of crime exceedingly small.

Again, the press employs reporters and agents with an almost reckless prodigality of expense, to hunt up and report every sweet morsel of scandal gossiped, and every species of crime perpetrated, while the good, unselfish, philanthropic, noble and heroic deeds performed by the thousands and millions of mankind go unrecorded.

A lecture on "Fungous Diseases of the Grape," by Wm. A. Kellerman, Ph. D., of the Agricultural College, Manhattan, was delivered, and will be found in the appendix.

A vote of thanks was tendered the lecturer, when the meeting adjourned to 10 o'clock next day.

FORENOON SESSION.

THURSDAY, December 9, 1886.

The meeting was called to order by the President, who announced as the first exercise, report of the Committee on Geology, as follows:

THE PHYSICAL PROPERTIES AND POWERS OF SOILS.

BY L. A. SIMMONS, WELLINGTON.

In the recent annual reports of this Society, my name has appeared in the list of standing committees as Committee on Geology, and the papers I have read have been termed the reports of the Committee on Geology, when in fact, the subject-matter presented and discussed was *soils*; and while at the outset I had something to say of their origin and formation, I have mainly dwelt on their constitution of mineral and vegetable ingredients, and adaptation to horticultural uses.

In order to give my dissertations any practical value to the horticultural student, as soon as I had briefly traced the probable origin and formation of the soils which compose the bare crust of the earth's surface, I necessarily left the domain proper of geology, and entering that of mineralogy, directed attention to the mineral and more recently to the vegetable ingredients entering into the composition of soils generally; and finally, in giving some analyses of different soils, have to some extent invaded the territory of agricultural (or horticultural) chemistry. In this broad field of investigation, while showing that all soils are largely composed of sand and clay, I have called particular attention to the fact that other mineral constituents—the alkaline as lime, potash, etc.; certain acids as carbonic, sulphuric, etc.; and even other minerals in comparatively minute proportions, together with some portion of organic or vegetable matter—are essential to fertility, or at least to that high degree of fertility requisite for horticultural purposes.

Recently, I have displayed in tabulated form an analysis of the wood of fruit-

bearing trees, and of the grain and stalks of cereals, and by a comparison of the ingredients found therein with the constituent elements of certain soils, have, I trust, clearly shown why the mineral as well as the organic component parts are essential to perfect growth; and have sought to emphasize the general and positively fundamental principle, "That a soil to be fertile must contain all the substances which the plant we desire to grow can obtain from the soil, and in such abundance as readily to supply its wants; while at the same time it must contain nothing hurtful to vegetable life."

Now as the bare enunciation of this immutable principle must impress the fact upon the mind of every tiller of the soil, that if upon an analysis of the soil of his orchard or garden it is found lacking in any one of the ingredients essential to fertility, either mineral or vegetable, he must supply it by the application of mineral fertilizers or vegetable manures; or if his soil unfortunately contains any substance pernicious or baneful to plant life, he must eradicate or neutralize it by the use of such materials as will by chemical action render it innoxious and harmless, before his trees and plants can make that healthful and vigorous growth requisite to the perfect development of luscious fruit. *This* would seem to be an appropriate place in which to discuss the improvement of soils by the use of organic or inorganic fertilizers; but I have thought it expedient at this time to present for your consideration some ideas in respect to the *physical properties and powers of soils*, rather than to attempt to elucidate the causes of the changes chemically effected in soils by any sort of manuring, for I am inclined to believe that an examination of these properties and powers is of as great if not of greater importance, and of far more practical value than any scientific research I might attempt to make in the labyrinth of chemical equivalents, affinities, actions and reactions, for the causes of the injurious consequences observable, where there has been no rotation of crops or the beneficial results following the use of different kinds of manures.

The physical properties of soils are quite numerous, and principally originate from and depend upon their density, and their capability of absorbing and retaining water, oxygen, and other gases, and caloric or heat.

The actual weight of soils per cubic feet depends to a great extent upon the materials of which it is composed. A cubic foot of dry sand weighs a little over one hundred pounds. If the soil consists of half clay and half sand, the same bulk in the same condition weighs about ninety-five pounds. Our ordinary farm soils, when all moisture is expelled, weigh about eighty or eighty-five pounds per cubic foot; but if to this soil an addition is made in the way of vegetable manure in considerable quantity, the weight per cubic foot will be found to decrease to about seventy, and perhaps sixty-five pounds, and experiments prove that what is known as a peaty soil, that is, one which is composed mainly of organic matter, in like dry condition weighs only about forty pounds per cubic foot. From these facts we learn that the sandy soils are actually the heaviest; that as the quantity of clay in vegetable matter is increased the weight decreases, and when a soil is very largely composed of vegetable matter, its weight is less than half that of a soil mainly composed of sand. Now as the weight is an index to density, I assume that our sandy soils are the more dense, our marly, clayey or loose soils far less so, and that either when heavily manured becomes comparatively light. Practically, the density of a soil is only important in view of sudden changes of temperature, as the experiments of Schübler prove that a dense soil retains warmth much longer after the sun goes down or a cold wind strikes it than a lighter one. It is found that a peaty soil will thus lose as much of its warmth in an hour and a half as a clayey soil will in two hours, or a sandy one

in three; and hence sandy soils are preferable for plants particularly sensitive to or seriously affected by sudden cold.

The next physical property of soils to consider, and one intimately connected with their density, is found in the state of division of the ingredients of which the soil is composed. While some soils consist of exceedingly fine particles of sand, clay, lime, etc., others contain coarse sand or gravel and stones; and while in the main the constituent parts of each, both organic and inorganic, may be nearly the same, there will be found a wide difference in capacity for production, arising from the fact that where all portions are in a state of almost perfect comminution, all the elements contributing to plant growth are available; while if locked up in stones, in size from coarse grains of sand to the huge boulder, the mineral elements conducive to plant growth are entirely inert and useless. It is contended by many that a portion of gravel or small stones in a soil are beneficial in times of drouth, enabling it to retain moisture for a longer period, and my own observation has been that a small portion of fine gravel in the soil is beneficial rather than otherwise in subserving the growth and bearing of the orchard.

This leads us to consider a third property or peculiarity in the composition of soils—that of firmness, or the power of adherence of the particles of which it is constituted. All soils, to a greater or less extent, as they dry in the air, become firm or hard, owing to a coherence of their parts. When composed largely of sand, this effect is but slight, but when composed largely of clay they become very solid—in common parlance, cloddy—and difficult to pulverize and bring into a good state of tilth. A soil of the latter character should never be plowed when wet, as the component parts are compressed in being turned by the mould-board, and if it is windy, or during the hotter portion of the season, the soil bakes, like adobe, and becomes compact and refractory. A stiff, clayey soil can be greatly improved in this respect by the addition of sand or gravel, or by giving it heavy dressings of stable or other vegetable manures, but as these methods are liable to be very expensive, when persisted in long enough to insure success, it is generally more expedient to resort to subsoiling and thorough drainage, which, with careful tillage, will in most cases remedy the natural defect. But at last, it is advisable not to select such a soil for horticultural purposes; and in the loess soils of this State I have noticed but few localities where the soils were so clayey that they were not thoroughly pulverized by the plow when in a properly dry condition. In passing, I would call attention to the fact that sandy soils, when in prime condition, offer only about half the resistance to the plow that the heavy, clayey soils do, and when wet, such resistance is equally increased, especially in the soils so clayey as to make them adhere to the plow or other agricultural implements. Hence the sandy soils are much more easily and inexpensively worked, an item of great importance in a region where labor is scarce and every owner of the soil is inclined to devote his efforts to a much larger area than he can cultivate thoroughly.

A fourth property of soils consists in their power to absorb heat. Some soils, under the direct action of the sun's rays and with the same exposure or slope, are found to absorb heat much more rapidly than others. This is more often noticeable in early spring, when a certain degree of heat is necessary to produce the germination of seeds, or promote the rapid growth of perennial plants. It is ascertained by actual experiment, also, that in summer, under the direct action of the sun, some soils attain a temperature of about 150°, while in the shade the thermometer marks no more than 80° or 90°. This power to absorb the heat, so necessary to the growth of vegetation, is found to depend more upon the color of the soil than upon its constituents. Thus, dark and brownish soils more speedily show the influence of solar heat than the yellowish or still lighter-colored ones; and while the lighter soils

which contain a fair per cent. of vegetable matter absorb heat more rapidly than the clayey, and the clayey than the sandy, yet the aspect or exposure is even a more important factor than the constitution or color in securing the heat requisite to rapid vegetable growth. And here we meet with rather a novel fact, proven by actual experiment, but not easily explainable, viz., that while the dark-colored soils absorb solar heat most rapidly, they are found never to attain a much higher temperature (only from 3° to 8°) than the soils of a lighter color.

Probably the reason of this may be found in the fifth property or power of soils—that of retaining heat; and some writers contend that in this respect soils differ far more than in their power of absorption. Now when the sun's rays are withdrawn, and cool currents of air, if not really cold winds, sweep over the surface, a more or less rapid loss of the heat absorbed inevitably follows. On this subject the experiments of Schübler are interesting and instructive, but space forbids me to give more than his conclusions, viz., that "a peaty soil cools as much in one hour as a bulk of clay in two, or of sand in three hours." Hence, we may see the reason why, when the sun goes down, the really sandy soil, by its power of retaining heat, would be able to maintain that degree of temperature essential to the germination of seeds and plant growth longer than the lighter and more friable soils containing a larger portion of clay or a considerable portion of organic matter. This power of retention, we can readily see, is very important in spring; but how is it in the heat of summer, when the degree of heat has become oppressive, if not actually injurious to the health of the roots of our trees and fruit-bearing plants? Will they not suffer later in the night? It would seem so, did we not recall the fact that, having absorbed the heat more slowly, its duration in the soil is quite nearly the same; and if the plants began to recover from the effects of excessive heat later in the night on a sandy soil, this would continue later the following morning, and so the actual injury effected by the constitution of the soil might be slight, if not inappreciable.

In this connection another well-known fact may well be mentioned—that as soon as the temperature in the evening falls to the dew point, the formation of dew on the growing plants greatly alleviates the effects of excessive heat, and those which have drooped or wilted in the afternoon speedily begin to revive. Now as on light, porous or highly-manured soils the heat is most rapidly absorbed, so in the evening it is most rapidly parted with, and the dew appears on all vegetable growth much earlier than on soils where heat is absorbed more slowly and retained more persistently; hence, the dews seem to have a compensatory as well as beneficial influence more noticeable on highly-fertilized soils.

The sixth well-defined property of soils is their capacity to absorb and retain oxygen and other gases from the air. Their capacity for absorption depends to a great extent upon their being compact or porous; for if the particles of which a soil is composed are closely compressed and adhere firmly, there is slight opportunity for the air to penetrate it; but if loose and porous the air will completely permeate it, and the portions essential to fertility be constantly utilized. Hence, the more thorough the cultivation and perfect the pulverization, the more complete will be the access of gaseous substances to each and every part. It has been proven by actual experiments that clayey soils absorb oxygen more rapidly than sandy, and those containing a large portion of organic or vegetable matter more rapidly than the clayey. Hence it is concluded that the power of a soil to absorb gases depends on its chemical constitution as well as on its natural porosity, or that secured by cultivation. So, if a soil contains some portion of protoxide of iron—as most of our reddish soils do—it naturally absorbs oxygen with avidity; or if the soil contains decaying vegetable matter, it will rapidly imbibe oxygen to carry forward,

if not to hasten, decomposition. I need not stop here more than barely to allude to the fact that oxygen is absolutely essential to the germination of seeds and the growth of plants, and that soils, especially when cultivated, are constantly absorbing not only oxygen and nitrogen from the atmosphere, but also carbonic and nitric acids, ammonia, and other vaporized ingredients, which contribute in some degree, if not materially, to plant growth, but hasten to call attention to the important fact that all soils absorb these gaseous substances—greatly conducive, if not indeed essential, to fertility—much more rapidly when they are in a moist condition. Hence the fall of rain, and the formation of dew at night, increase and accelerate the absorbing power of the soil, and so stimulate the growth of vegetation. And hence the effects of rains and dews during the dry seasons are beneficial not only because of the water they supply to the thirsty ground, and the vapors which they carry down with them to the surface, but they actually augment the capacity of the soil to utilize the various gaseous substances contained in the atmosphere, whereby plant growth is nourished and invigorated.

Some of the most important properties of soils arise from their relation to water. The fact will stand unquestioned, that any soil when dry will absorb moisture from the atmosphere if it contains any humidity. Different soils possess this power in unequal degrees, depending to some extent on the ingredients of which they are composed. Schübler found that during one night of twelve hours, where the air was ordinarily moist, one thousand pounds of dry quartz sand gained no appreciable weight, while the same quantity of calcareous sand absorbed two pounds, a loamy soil about twenty, and a clayey loam twenty-five pounds. Sir Humphrey Davy found this power to be possessed by soils in almost exact proportion to their fertility; that 1,000 pounds of the very poorest soil in England could absorb only about three pounds per hour, while the most fertile gained sixteen pounds during the same period. Now as the increase in weight shows exactly the amount of moisture absorbed, we have a ready method of measuring the capacity of any soil in this respect, and hence of judging to some extent of its capacity during the nights in a season of drouth of restoring to vegetation from the atmosphere in part what it lost during the day by evaporation.

Allied to this property of soils is another, far more important, viz., the power or capacity of soils to contain water. When rain falls, all soils take in some portion of water, and hence increase in weight; but it is ascertained by experiment that their capability in this respect differs considerably, and that when they are so completely saturated that any excess will run off, some have become much heavier than others. For instance, it is found that a hundred pounds of really sandy soil can contain or hold incorporated among its particles only from twenty-four to twenty-eight pounds of water, and a loamy soil about forty pounds, while a clayey one is capable of holding from sixty to seventy pounds, and a soil containing a large amount of vegetable matter a still greater quantity. In so dry a climate as we have in this State, where the annual rainfall is only about three-fifths as much as in the great Mississippi basin, this power of taking in water is one of the highest importance, for the more water a soil can receive during the season of abundant rains, the more it can contain within its pores, the more it has to part with by evaporation during the succeeding season of heat and drouth. Again, the soil that can contain a large quantity of water has to some extent its pores closed by it, and hence as the air is partially excluded, evaporation is impeded.

Incidental to this power of soils to contain water, is a quality (it is scarcely deserving the name of property) worthy of attention. All soils containing clay contract when drying, as do those containing a large portion of organic matter, while all in proportion to the sand they contain, have less of this peculiarity. As a general

rule, the soils capable of containing the most water have the greatest tendency to contraction, and hence to crack in times of drouth. To allow the soils of orchards or gardens to crack during a drouth, is to give an opportunity for trees and plants to suffer far more seriously than if the soil is properly pulverized, hence I trust all horticulturists will be prompt to check this tendency by thorough cultivation.

This brings us to another property of soils, which may be defined as power to retain water when exposed to the air. Everyone has observed how much more rapidly some fields dry off and become in a tillable condition after a heavy rain, than others, where the natural drainage is apparently the same; also, that unless the air is completely saturated with moisture—which rarely happens in Kansas—watery vapors are constantly arising from the surface of the earth; in other words, that the soil is yielding up its moisture and gradually drying. Now as this exhalation constantly goes on, and we notice that the natural drainage will not account for the difference in drying so as to be tillable, we are led to examine the constitution of the soil to find the cause of such diversity. Experiments have shown that “sand will become as dry in one hour as pure clay in three, or a piece of peat in four hours.” Hence our sandier soils have far less of this retentive power than the more clayey, and if they contain a considerable quantity of vegetable matter, their power of retaining water is greatly augmented. Hence it follows that the more thoroughly we can enrich our soils with stable or barn-yard manure, the more capable they become of sustaining a vigorous growth of our trees and plants during the dry season, or one of drouth. The rule is probably inflexible, that the power of a soil to retain moisture is in exact proportion to its power to absorb and contain water, and hence the loamy, clayey, loess soils of Kansas, especially when they naturally contain a large amount of organic matter, or have been heavily manured, show a remarkable, yea, wonderful retentive capacity in seasons of drouth. In this connection, an attribute or quality, which might be termed a property of soils, deserves a passing notice. Some soils expand but slightly, while others increase measurably in bulk when the water contained within them congeals, when by hard freezing the water they are holding becomes ice, and in so doing occupies more space. Hence some soils are said to “heave,” while others display this tendency but very slightly. This inclination to expand by congelation, is seldom noticed in sandy soils, but is not uncommon in those which are clayey or contain a large amount of vegetable matter, and are thoroughly saturated with water when winter sets in. As every particle of water must expand in freezing, it follows that the more water a soil contains, the more its vegetable and mineral component parts will be displaced by congelation; and if the soil is capable of retaining a large quantity of water, its expansion will be proportionately large. So that I think it may be laid down as a general rule, that the tendency of a soil to expand by freezing is in exact proportion to its power to contain and retain water. Now while this expansion of soils in freezing or “heaving” often causes a serious injury to strawberry and probably other small-fruit plantations, it is of almost inestimable benefit to all soils, for it is the engine of pulverization, and by complete pulverization chemical action is induced, and the plant food existing in the soil made available and ready for use.

But here, I hasten to say that I am not inclined to believe the peculiar capability of our Kansas soils to sustain vegetable growth in seasons of drouth depends solely on their power of containing and retaining water, for observation has led me to hold that it is to some extent, perhaps largely, due to another property or power of soils, which may be termed capillary. Our lady friends all know that if the tray or saucer of a flower-pot contains water, the surface soil in the pot will be kept moist, and the geranium or other flower maintain a vigorous growth. Now the moisture rises in the soil much as it does in the roots of the plant itself. The constant

evaporation from the leaves induces a constant flow of sap, which is mainly the water taken up by the roots, and conveyed through them to the body, branches, and leaves of the plant. So through the pores of the soil, as through the sap-vessels of the plant, water constantly ascends in the soil as it is withdrawn from the surface by evaporation. This takes place in the fields, the orchard, and the garden, and hence we see the effects of shade and especially of mulching, which by retarding evaporation increases the power of the soil to retain moisture. But when the surface even beneath the mulching begins to dry, moisture is supplied from beneath, and the soil begins to draw by this capillary power it possesses from the reservoir of the subsoil. The sandier soils, and those which contain an abundance of vegetable matter, being more open and porous, permit the ascent of water much more freely and rapidly than the more compact clayey ones, and if the subsoil is that peculiar stiff clay almost impervious to water, known as "hard-pan," however porous or however great the capillary power of a soil may be, it will utterly fail to secure an appreciable quantity of water from it. Therefore, if the subsoil of any tract is so compact in its formation that it will not absorb water, the soil alone must furnish the entire supply for plant growth, and hence the almost total failure of crops on land having a "hard-pan" subsoil in time of drouth. But if the subsoil is, though clayey, so porous that it is capable naturally of absorbing a large quantity of water, or is made so by subsoiling, it lies beneath the portion of the soil we cultivate as a reservoir, from which the soil by its capillary power will draw the supply demanded by vegetable growth during periods of rapid and long-continued evaporation. To the nature or favorable constitution of our subsoils, then, I firmly believe the capabilities of our soils to maintain tree and plant growth, and mature farm crops in periods of drouth, should be mainly attributed. If this is correct, when we select the site for an orchard the matter of first importance for investigation is the nature of the subsoil.

The importance of a thorough knowledge of these several properties and powers of soils to the intelligent and progressive horticulturist, when he selects the site of his orchard and fruit garden, when he would protect to the best of his ability his trees and plants from the injurious effects of heat and cold, when he seeks to escape the pernicious results of too much water in his over-retentive soils, and especially when he would guard most effectually his pets and treasures, yea, the profits of his labor, his very livelihood, from the disastrous effects of our frequent, in fact almost annual drouths, has, I doubt not, been constantly suggested to the minds of all, as you have listened to this too-lengthy dissertation; and so I may well forbear dwelling on its superlative value from a practical standpoint.

Following this, the President announced the receipt of a telegraphic message of greeting from the President of the Missouri Horticultural Society, then in session, as follows:

LEXINGTON, MISSOURI, December 9, 1886.

To George Y. Johnson, President Kansas State Horticultural Society: The Missouri State Horticultural Society, now in session, sends fraternal greetings to its co-laborer in the work of advancing horticultural interests and intelligence.

J. C. EVANS, President.

On motion, the President was requested to make the following response:

EMPORIA, KANSAS, December 9, 1886.

Col. J. C. Evans, President Missouri State Horticultural Society, Lexington, Missouri: Your brotherly love is fully appreciated. We are heartily with you in the work of advancing the horticultural interest.

GEORGE Y. JOHNSON, President.

The President announced a lecture on "Ornithology," by David E. Lantz, M. Sc., Agricultural College, Manhattan, which was delivered, and will be found in the appendix, in the department of Standing Committees.

DISCUSSION OF ORNITHOLOGY.

J. W. ROBISON, Towanda: I knew of an apple orchard of forty-five acres planted in the open prairie, and its location was such as to invite the migratory class of birds to frequent it; yet this orchard became infested with the canker worm, which almost stripped it of foliage. Birds did some good work in the rows on the south side, and even some branches in some of the trees escaped injury. But a little parasite, the same as is found on the silk worm, became prevalent among them and checked their work. The little cow blackbird has not been mentioned in the lecture. It is one of our best helpers in keeping down the increase of noxious insects. It is very helpful in the destruction of the cut worm which breeds in the ears of corn.

PROF. LANTZ: I fully recognize the value of many birds that time would not permit mention of in my report.

Discussion closed, and on motion the reports of committee on the currant, grape, and gooseberry manuals, were referred to the Secretary, with instruction to compile for publication.

The committee on Secretary's and Treasurer's financial statements asked the privilege of reporting, which was granted.

REPORT OF COMMITTEE ON SECRETARY'S AND TREASURER'S FINANCIAL STATEMENTS.

Your committee have carefully examined the reports of the Secretary and Treasurer, and report that they have found them correct.

SAMUEL REYNOLDS,
GEO. OLIVANT,
J. S. HASTING,

On motion, the report was adopted.

Committee.

The following paper was then presented:

THE FUTURE OF THE ARKANSAS VALLEY FROM A HORTICULTURAL STANDPOINT.

BY W. E. FOSNOT, HUTCHINSON.

When we look at the vastness of the Arkansas valley, and the territory that drains into it, very few persons have any idea of its magnitude or what it may be made to produce. Think of twenty thousand square miles; about one-fourth of the State of Kansas, with 640 acres to the square mile, gives us twelve million eight hundred thousand acres, three-fourths of which, or in round numbers say eight million acres, are adapted to the growth of trees and fruit. Twenty years ago there was scarcely a tree on this vast tract, excepting the few nature had scattered along the streams. What do we find to-day? Over 35,000 acres of artificial forest trees; 270,000 apple trees, 25,000 pears in bearing, 2,000,000 peaches of bearing age, 130,000 plums, and 110,000 cherries in bearing. Of the orchards that are too young or have not fruited there are 850,000 apples, 38,000 pears, one and a half million peaches, 138,000 plums, 185,000 cherries, and nearly 1,200 acres in nursery stock. While the trees reported as bearing are numbered among the millions, yet there are very few that have produced any large quantity. The immense number of peach trees that have been planted might lead one to think this an exceptionally favored land for the production of that class of fruit, but an observation of sixteen years shows it to be what I would term a complete failure, and the only excuse for planting it may be summed up in the item: "It is a good tree to plant for fuel." And for this purpose a seedling is as good as a budded tree. Should the method of saving the peach crop by filling the tops of the trees with straw or hay prove a success, it would be thousands of dollars in the pockets of the planters of this State, and the information should be

furnished to every newspaper in the State, and to every man who owns a peach tree. At the semi-annual meeting held at Wichita, in June last, the method was mentioned, and several years ago, at a meeting held in Wyandotte, the same thing was spoken of in connection with some patented affair. Now there is no patent on filling the tree-top full of straw and old hay, neither is there a patent on tying the limbs together with a straw rope to keep the hay from blowing out during the winter-time. Will the Society settle the question? This, like dozens of other questions, may seem of no consequence to those who know, but it is of some consequence when we see fruit trees planted by the million and no fruit to pick from them. While some of the members may know to a certainty, there are others who do not, and to the homesteader as well as the old settler the information will be welcome.

With the rapid settlement of the upper Arkansas valley follows the life-work of planting trees and building homes. The failures we have made in the past should be avoided; and while *we* may avoid some of them, there are hundreds and thousands who need primer lessons in the fruit business, and we see among the planters of the three and a half millions of peach trees in the Arkansas valley many who need information. Tree agents are doing a large work in furnishing trees; but when a thought is taken of the hundreds of thousands of trees that are delivered, and from whence they come, the idea is suggested that the Society should have some means of placing before the planters, each year, information concerning varieties, and how to prevent swindling.

Very few have systematized their methods of labeling, and in this line much good, it seems, may be done by the Society in aiding those who have no knowledge of a future advantage in making a permanent record of their doings.

There is probably no portion of the State better adapted to the culture and growth of fruit than the Arkansas valley. Apples, pears, cherries, plums, quinces, grapes, and small fruits generally, are doing as well as could be expected. The planters are, as a rule, inexperienced in fruit-growing, and only learn of the mistakes after years of toil; but there is push and energy, and a desire to better the present condition. One thing that is sadly neglected is local and county organization. One reason for this seems to come from no one desiring to lead. Something special is needed to stimulate local feeling.

Among those who are benefiting the great Arkansas valley may be mentioned D. M. Wright, of Hutchinson, who has growing on his grounds nearly forty varieties of grapes. The information and advantage the Arkansas valley will receive through his efforts in testing the newer varieties of grapes will be difficult to estimate. J. J. Measer, west of the city, has twenty-six varieties of plums, two years of age, that he is testing to prove or disprove their value for the Arkansas valley. To-day there is little need of the western portion of the State reaching east of the center for its supply of trees.

To determine what the future of the valley will be is beyond the knowledge of the most enthusiastic man, either in the eastern portion of the State or in the Arkansas valley. The future will be known only when orchards have reached the Rocky Mountains.

The President announced a report of committee on

HORTICULTURE IN CONNECTION WITH FARMING.

BY SAMUEL REYNOLDS, LAWRENCE.

I can hardly expect to present any new thoughts on this subject, which has been so often and so well discussed. About all I can hope for is to refresh your memories, and remind you of your duties and privileges in this connection.

Man is endowed with a threefold nature—his moral, intellectual and physical;

each of which must be duly educated and developed, and its wants provided for, in order that he may stand forth in his perfect manhood, with a sound mind in a sound body.

For the development of his moral nature, our wise and beneficent Creator has made ample provision, both in the old law and the new gospel. The moral law was delivered to Moses on Mt. Sinai nearly four thousand years ago. That law has never been abrogated, and is therefore as binding now as when first delivered. The eight injunctions and two commands contained in the decalogue comprise the moral law under the old dispensation, while a fuller and more explicit code is contained in the gospel of peace and good-will to man. What can be more sublime than that matchless precept, "Do unto others as ye would they should do unto you"? This precept alone, if honestly and faithfully practiced, would change this world into a paradise. There would be no need of bolts or bars, criminal courts or prisons; and honesty, truth and righteousness would reign supreme. To complete this moral education, we have the pulpit, Christian organizations, and the religious press—three great human agencies in the moral economy.

The education and the development of the intellectual nature of man is provided for by the common school, the college, the press, the rostrum, and many other agencies within the reach of most of us.

As all our bodily sustenance is drawn from Mother Earth, and as man could not exist unless his physical or animal wants were supplied, our Creator has wisely placed us upon a fertile soil containing all the elements of animal life and growth, with capabilities unlimited, from which we may draw not only our sustenance, but every luxury to gratify the palate and satisfy the taste; and here comes in the province of horticulture.

As an indication of the possibilities of the soil, I will remind you that Japan has 12,000,000 acres of land under cultivation, and a population of 38,000,000, making each acre support $3\frac{1}{4}$ persons. Not only is the population of this island supported from this 12,000,000 acres—clothed and fed—but they yield annually 40,000,000 pounds of tea, 25,000 bales of silk, and large quantities of rice, tobacco and hemp for transportation; and yet it is quite certain that the utmost capabilities of the soil have not been reached there. At this same rate, Kansas would feed more than all the inhabitants of the United States, Canada, England, Ireland and Scotland combined; and who knows, but what in the ages to come, the demand to feed such a number will be required of her?

It has long passed into a proverb, that every farmer should have an orchard and a garden, and without which no farm is complete. I will not, therefore, insult your intelligence by any argument in proof of this fact, for I am sure none of you will deny it. This proposition being admitted, the question comes up, what are the best means to be used to obtain the best results in both fruits and vegetables? The manual on apple orchards, published by this Society, gives full and excellent directions for growing a good orchard of the most approved varieties, in the shortest possible time, based upon the experience of the most successful fruit-growers of the State. By following these instructions, success is almost certain; and it seems almost superfluous to add a single word of directions. As a reminder, however, I will say, plant in good soil, having good drainage, early in the spring, but little, if any, deeper than the tree stood in the nursery row; plant strong two-year-old trees, not less than 33 feet apart, keep all weeds and grass hoed away from the young, growing trees, and the soil well and frequently stirred. In fact, do everything thoroughly and well, and you will have apples to gather in less than half a decade. These and similar directions are old to most of you, who have heard them again and again, but nevertheless they will bear repeating. So much for the orchard.

For the choicer and more transitory kinds of fruit, I wish now to refer, and I hope our friend B. F. Smith will not think that I wish to steal any of his thunder, or (to use a nautical phrase) take any of the wind out of his sails, if I refer to the strawberry. He can tell you more about the seventy varieties he cultivates, the tint of their foliage, their comparative fruitfulness and quality, than I can. But there is one thing he can't do: he can't appropriate more Crescents in a given time nor enjoy them any better than I can. If there are any friends here who have lame backs, stiff joints, sciatic or other forms of rheumatism, thereby making it uncomfortable for them to do much stooping in the matter of hoeing and weeding, I would say plant the Crescent; it will do the best it can for you, and if you plant early next spring you will have to wait but one year for a supply of this delicious fruit. To those who use clean and thorough culture, I will say that it will amply repay you for the best of care. Plant the strawberry on rich deep soil, for it has a large appetite and excellent digestion, and its roots have been known to penetrate two feet below the surface. Even in favorable seasons, hard shallow soils give but a brief season of strawberries; the fruit ripens all at once, and although the first berries may be of fair size, the fruit at the end of the crop will dwindle down to the size of peas.

Every farmer should have, as well as strawberries, the later kinds of small fruits, such as raspberries, both black and red, blackberries, cherries, and grapes. By having a small plantation of each in connection with his apple orchard, he can have and enjoy fresh fruit on his table at every meal, if he so wishes, the entire year round. In speaking of fruit, Dr. Hall says: "It is a mistaken idea that no fruit should be eaten at breakfast. It would be better if our people would eat less bacon and grease at breakfast, and more fruit; in the morning there is an acrid state of the secretions, and nothing is so well calculated to correct this as the acid in fruits. The apple is one of the best of fruits, and either baked or stewed will generally agree with the most delicate stomach. Apples are an excellent medicine in many cases. Green or half-ripe apples stewed and sweetened are pleasant to the taste, cooling, nourishing and laxative, far superior in many cases to the abominable doses of salts and oil usually given in fever and other diseases. Raw, or dried apples stewed, are better for constipation than pills. The small-seeded fruits, such as blackberries, raspberries, currants, and strawberries, may be classed among the best foods and medicines. The sugar in them is nutritious, the acid is cooling and purifying, and the seeds are laxative. We should be much the gainers if we would look more to our orchards and gardens and less to the drug stores. To cure fever or act on the kidneys, no febrifuge or diuretic is superior to watermelons." Such is the celebrated Dr. Hall's testimony. With reference to the garden, I can speak from thirty years' experience in Kansas, and my garden is one of the earliest and best in the neighborhood. No farmer should be without a good garden. It pays from a money standpoint, for if freely used and enjoyed it furnishes nearly half the living of a family; saves the price of medicines, and reduces the size of doctors' bills.

The first vegetable that appears in my garden is rhubarb, or pie-plant, of which a dozen or so of good roots will supply an ordinary family. The plant is a great feeder, and should have a heavy dressing of manure spread around the crown every fall. This, and the division of the roots every few years, is necessary in order to produce large stalks.

Asparagus is the next luxury that makes its appearance. I often wonder why this delicious plant is not found in every garden, for it is the hardiest and most productive vegetable known to the horticulturist. Our fathers and grandfathers thought we could not grow it without digging a deep pit and filling it with manure, in order that the roots might have a deep, rich bed in which to luxuriate. Happily this theory is exploded, and asparagus is now planted by the acre, almost as readily as any other

crop. About the easiest and best way to secure an asparagus bed, is to take a piece of very rich land, the size you want your bed, plow it up very deeply in the fall, and let it remain rough till spring. Then about the middle of April, put your seed to soak in quite warm water, changing the water every day to prevent souring. Then in about a week, harrow down the patch very nicely, and plant the swollen seed in rows $3\frac{1}{2}$ feet apart. When the plants are well up, thin out to two feet apart in the rows, keeping them well cleaned and cultivated all summer. They will grow some two feet high the first season, the tops of which must be mown off in the fall, and a heavy dressing of well-rotted manure spread over the ground. Early the next spring, run the harrow or rake over the bed, pulverizing and working in the manure. This second season many of the stalks will be large enough for use, and the next season you can look for a full crop. This excellent vegetable comes very early in the spring, and the sprouts can be cut every day or two for several weeks. It is a great feeder, and if heavily manured every fall, a bed will last a lifetime.

Lettuce comes next in order, and even if grown without the protection of glass, may be sown with safety as soon as the frost is out of the ground. Don't wait for warm weather, as it will stand a great deal of freezing without injury. If you sow it very thickly, then as soon as it is large enough to get a good hold of with the fingers, cut it above the heart. It will sprout again, and the operation may be made a dozen times during the season.

Celery, which is a vegetable greatly appreciated of late, can be grown successfully with plenty of shade and water. These can be furnished artificially, as a very small patch will suffice for a family. A good plan is to sow the seed in a box in the spring, and after transplanting the young plants at least twice, to give them root and strength, set them out in June, six inches apart, in shallow trenches, covering them through the heat of the day with boards, supplying water freely when needed. Then as the plants grow, draw the soil up to them, keeping the heart above the surface. After the stalks have attained a good size they can be bleached by drawing the soil to the tops of the plants.

I have spoken of these four excellent vegetables because they are so often absent from the farmer's garden, and also for the reason that the first three mentioned come so very early that they are very valuable on that account, as well as for their intrinsic worth. In this short paper I can only mention some of the other standard vegetables, most of which ought to be in every farmer's garden. These are radishes, spinach, onions, peas, beans, carrots, parsnips, cabbage, cauliflower, turnips, beets, tomatoes, and early potatoes. I shall leave all these to be discussed by the able committee on vegetable gardening.

Allow me to remind you of the medical properties of some of the vegetables above given.

Rhubarb contains an acid which is excellent in fevers, and when its use is continued it is not only a preventive, but a cure for constipation.

Asparagus is an active diuretic, and affords relief to the kidneys and kindred glands.

Lettuce is both a sedative and nervine; it is also a very good remedy for insomnia, containing as it does a small proportion of opium.

Celery increases the secretions, and acts also as a nervine.

Onions are an anti-spasmodic and an expectorant; they afford relief for colds, and are also diuretic.

Peas are alterative and tonic, and very nutritious.

Beets contain a large proportion of sugar.

Turnips are diuretic and expectorant.

Radishes stimulate and promote secretions.

Parsnips are very active in stimulating milk secretions.

The potato contains a large proportion of starch, besides being antiscorbutic. There is never any scurvy where potatoes are eaten freely.

Thus you see that the vegetables act as medicine as well as the fruits, while they also serve as food. They are all alimentary as well as nutritious, and tend to keep the system in a healthy condition, supplying a sufficient amount of natural heat, and replacing the worn-out tissue.

With an abundance of fruits and vegetables at hand, what a rich store of bounties has the farmer's wife from which to spread her luxuriant table. How easy and with what satisfaction can she provide a dainty meal for a friend; and how enjoyable every meal for the family may be made. How different from his fare, who separates horticulture from his farming. His bill of fare is usually bread and meat and potatoes for breakfast, potatoes and meat and bread for dinner, and by way of change, meat and bread and potatoes for supper.

In the matter of edible enjoyment, it seems to me that the horticulturist has a great advantage. While he receives his bounties direct from the hand of nature, fresh, pure and unadulterated, others have to take almost everything on trust. They can't tell how long the fruit has been picked, how stale the vegetables are, nor how or when they have been handled. When they take their strawberries and cream, the latter article perchance may be composed of this formula: one part chalk, two parts calves' brains, three parts molasses, and four parts water. When the horticulturist sits down to his dish of delicious, freshly-picked strawberries and his rich Jersey cream, he knows the pampered epicurean has no viands to equal his. The "milk and honey" of olden times is discounted incalculably by the rich bounties of the farmer's orchard and garden.

As horticulturists we have great reason to congratulate each other, not as a "mutual admiration" society would, but as rational and intelligent men.

Before we part, I shall ask you to take a ride with me along one of the highways in my own county. You see the wild sunflowers luxuriating in all their boastful glory on each side of the road; the culvert before us has one plank broken and two loose. We must be careful, or the horse will get his foot entangled. You see how dilapidated the fences are. The herd law would ruin the owner of that farm, for his animals would all find their way to the pound. We turn through these bars to go up to the dwelling of Mr. Slackman. The "gymsum" weeds greet our olfactories with their strong perfume. As we approach the dilapidated shanty of a house, we see the pigs wallowing in the door-yard; the ragged, dirty children are making mud pies at the door; the chickens are roosting on the chairs; the wife, in a greasy, ragged gown, is gazing through a broken pane in the window with a vague look of wonderment; the husband and father of this household is just emerging from a stable built of crotches, poles and corn stalks, well ventilated by a young cyclone. The whole premises are entirely destitute of shade trees, flowers, garden, and orchard. The personal appearance of Mr. Slackman is no improvement on that of the other members of the family. His toes protrude quite rudely from his number 11 boots; his long, unkempt hair is waving through an opening in the top of his hat; his elbows are out; his breeches have sustained a serious breach; and to cap the climax, the narcotic juice from a large quid of the weed is trickling down each side of his capacious mouth.

Mr. Slackman was told, before he emigrated from Pike county, Missouri, that fruit trees would not grow in Kansas, and he has always believed it, except when he got fruit from his neighbors' orchards.

After the usual salutations, we tell him that we called to talk to him about our "Improvement Society." "What's that?" says he. "My hogs are as good as any-

body's, I reckon. They don't need improving." Oh, say we, that is not the object. The aim of the society is to improve our homes and their surroundings, by encouraging the planting of shade and ornamental trees, and flowers; by encouraging gardening and fruit-growing, thereby elevating us to a more æsthetic and higher plane of living, thus increasing our usefulness and happiness in the world. We give him a printed copy of the constitution of our Improvement Society, and ask him to consider the matter of becoming a member.

We now pass on to the farm of a friend, whose initials are I. X. L., and whose home is my ideal of thrift, comfort and happiness. The drive from the public road to the house is flanked with a row of fine walnut trees on either side; clumps of evergreens and beds of flowers beautify the front yard; the house is painted white, with green blinds; the out-buildings are all convenient and in good order; south of the house is a large garden filled with an abundance of vegetables and small fruits; a short distance in the rear is the five-acre orchard, filled with apple, pear and cherry trees—the varieties having been selected from the lists recommended by this society; the children are at school, the husband and father has gone to market with a load of fruit, and the happy wife and mother is at the piano playing the variations of "Home, Sweet Home."

Now, my friends, look at this picture, then at that, and tell me, if you can, why horticulture should not be connected with farming.

While we are laboring so earnestly and successfully to supply our bodily wants, let us always bear in mind that the intellectual nature is higher than the physical, and that the moral nature is above all.

The subject of Forestry was then taken up, and the Secretary offered the following communication:

DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C., Dec. 6, 1886.

Gentlemen of the Kansas State Horticultural Society: Allow me to embrace the opportunity of your annual meeting to extend my thanks to members of your association, and especially to your Secretary, for the many courtesies received from them during my recent journey through Kansas. I may say that by the aid of these gentlemen alone has it been possible for me in a short time to gain an insight into prairie planting, which allows me to speak more intelligently on its requirements than I could otherwise have done. At the request of your Secretary, and in acknowledgment of the excellent forestry work which you are doing, I venture to send as a contribution to your meeting a part of my report on the observations made during my journey, still unpublished, treating on some general principles of forestry which had appeared to me overlooked in Western planting.* If I seem too authoritative on the subject, I hope you will excuse me on the ground that I speak professionally, and believe me bent upon advancing a reform work in which much has to be learned and accomplished. As Secretary of the American Forestry Congress, I wish also to express the thanks of our association for the representation which your body had delegated to our Denver meeting. If the results of that meeting have not seemed as satisfactory to Western planters as might have been expected, the reason should be found in the preponderance at the meeting of Colorado and Rocky Mountain interests, which stand in more urgent need of immediate attention than those of the plains, which are so well taken care of by your Society. Wishing you a successful and helpful meeting, I am, most respectfully,

Yours for forestry,

B. E. FERNOW,

Chief of Forestry Division.

* NOTE.—The notes referred to were placed in the hands of the Committee on Forestry at the close of the meeting, and have not been returned.—SEC'Y.

THE RUSSIAN MULBERRY.

I. HORNER, Emporia: I have spoken of the Russian mulberry on several occasions before this Society. I now only wish to add a few words in testimony of what has been said. It has been claimed that this tree is only a brushy shrub. I here exhibit to you a section of a Russian mulberry tree five years old, and which has been grown in a shelter belt and overshadowed with cottonwood trees. It is five inches in diameter, and, as you see, a nice, straight and smooth trunk eight or nine feet long. Another year's growth would make it suitable for posts. I measured one tree which gave a circumference of $37\frac{1}{2}$ inches at a point two and a half feet above the ground, and was only eight years old. This variety has proven to be most vigorous. It is one of the very best trees for shelter belts and fence posts. From a hedge-row 15 rods long, I saw 200 nice fence posts cut. This wood is very durable, only the sap wood rotting when set in the ground. Its fruit is inviting to birds, and they will not destroy your other fruit as long as the mulberry crop lasts. We can vastly increase its value by carefully selecting seed from such trees as show desirable wood developments. It is a tree for fuel, shelters and posts for the western prairies.

Adjourned to 2 o'clock p. m.

AFTERNOON SESSION.

THURSDAY, December 9, 1886.

President Johnson in the chair. The papers on forestry by J. F. Hursh, Garfield; W. J. Colvin, Larned; Leonidas Carson, Anthony; Theo. Boggs, McPherson; M. Mohler, Osborne, were, for want of time, passed to the Secretary, without reading, with instructions to publish in the Manual.

The following papers were read, and referred for publication in the Forest Manual: Forestry Experience in Stafford County, by C. G. Neil, Stafford; The Annual Growth and Average Dimensions of Forest Trees Grown at Sterling, by J. B. Schlichter; Results of Forest-tree Experiments at the College Farm, by Edwin A. Popenoe, A. M., Agricultural College; Report of Standing Committee on Forestry, by M. Allen, Hays City.

The Hatch experimental station bill was offered by the Secretary.

On motion, the Society fully indorsed the provisions of this bill, and instructed the Secretary to earnestly request the Kansas members of Congress to give it their hearty support.

RESOLUTION ON FORESTRY EXPERIMENTAL STATIONS.

On motion, the following resolution, offered by J. F. Martin, Winfield, was next considered:

Whereas, Judicious forestry can be more successfully and rapidly developed through the help of scientific forest stations, established in the arid, treeless districts; therefore, this Society earnestly implores the State Legislature to establish and provide for the maintenance of two forest stations at the most suitable places in western Kansas.

DISCUSSION OF THE RESOLUTION.

GEO. OLIVANT, Conway: The Hatch bill provides for a station at the Agricultural College, which is properly within the timbered belt. It should be in the western part of the State.

M. ALLEN, Hays City: A bill covering the point of suitable location for a station will be presented to the coming Legislature.

F. WELLHOUSE, Fairmount: Experiments at the Agricultural College will not help the Western planter. They are valuable for general purposes.

The resolution was unanimously adopted.

The following resolution on the ruling of the General Land Office against the Osage orange as a timber tree was offered by L. A. Simmons, Wellington:

Resolved, That this Society regards the ruling of the Commissioner of the United States General Land Office, whereby the Osage orange is excluded from the list of trees which may be planted on timber claims, as unreasonable, unjust, and highly prejudicial to the best interests of the settlers of the western portion of this State.

On motion, the resolution was unanimously adopted, and the Secretary instructed to forward to each of the members of Congress from Kansas an authentic copy of this resolution.

GENERAL FORESTRY DISCUSSION.

PROF. E. A. POPEX: The present value of the timber in the College forest is greater than the product of the same land would have been if planted each year to corn.

I. HORNER: We should not advise planting any variety that is not useful for fencing.

GEO. OLIVANT: Planting on unbroken land cannot result otherwise than in failure.

I. HORNER: Buffalo-grass sod requires deep and thorough plowing; but I would prefer the best lands in the sand-hills for trees.

Discussion closed, and unfinished business was taken up.

The committee on the President's semi-annual address asked permission to report, which was granted.

REPORT OF COMMITTEE ON PRESIDENT'S SEMI-ANNUAL ADDRESS.

Your committee to whom was referred the President's semi-annual address beg leave to report that we have carefully examined this last labor in behalf of our Society, performed by our deeply-lamented Vice President, and find it full of suggestions for a guide in our future labors, and call attention specially to the following points, viz.:

1. That the standing committees should prepare their reports with great care, after giving their topics a thorough investigation.

2. That this Society should have a standing committee on experimental horticulture.

3. That at our annual meetings we should devote our attention to the larger fruits, especially the apple, peach, pear and grape, and our semi-annual to the small fruits.

4. That this Society should make still more strenuous efforts for the publication and distribution of horticultural information to the masses of the people of our State, as horticultural knowledge is their safeguard as well against the frauds of unprincipled agents and dealers as against useless and disastrous experiments.

To these several points presented by our esteemed co-worker in his last message to us—the last act in his highly useful and honorable horticultural career—your committee believe this Society should give particular heed and attention, as the last horticultural words of our friend whom we highly esteemed and honored while living, and whose memory we profoundly and gratefully cherish now that he has passed to the summer land.

On motion, the report was adopted.

REPORT OF COMMITTEE ON CONSTITUTION.

The following report was presented by L. A. Simmons, chairman:

Your committee ask permission to offer the following resolution:

Resolved, That the principal office of the Society shall hereafter be at Topeka, whenever the State Legislature shall make suitable provisions for its maintenance at that city. And that all proceedings

of the Society conflicting herewith are hereby declared void and of no effect; and that this resolution be recorded as an amendment to the act of incorporation, which fixed the office of the Society at Lawrence, but subject to removal by the Society.

On motion, the resolution was unanimously adopted.

REPORT OF COMMITTEE ON PRESIDENT'S ANNUAL ADDRESS.

Dr. Chas. Williamson, chairman of the committee, presented the following report:

Your committee to whom was referred the President's annual address, would respectfully submit the following: We would recommend to the State Legislature that a law be passed which shall prohibit any increased assessment of the value of lands, because of the forests growing thereon, either natural or artificially planted. We also recommend to the State Legislature that an act be passed organizing the Kansas State Horticultural Society into a Bureau of Horticulture, as recommended in the President's address.

On motion, the report was adopted.

REPORT OF COMMITTEE ON OBITUARY.

Dr. Chas. Williamson, for the committee, reported the following resolutions:

Resolved, That in the decease of Dr. Chas. Reynolds, of Junction City, this Society fully realizes the great loss it has sustained of a warm, devoted friend, an earnest worker in behalf of the Society's best interests.

Resolved, That the death of our honored and highly-esteemed Vice President, Hon. M. B. Newman, of Wyandotte, has bereft the Society of one of its best members, ablest counselors, and a generous and warm friend.

Resolved, That this Society keenly feels the affliction which has removed from our midst Hon. C. H. Graham, of Leroy, who for years was a faithful member of our Board, and an earnest and constant worker in the highest interests of the Society; that our loss is well-nigh irreparable, and has left a vacancy in our ranks which time only can fill.

Resolved, That this Society hereby extends its sincere and heartfelt sympathy to the families and friends of each of the deceased friends, and hereby assures them that the sorrow inevitable under these occurrences is ours as well as theirs.

Resolved, That an authentic copy of these resolutions be forwarded to the family of each deceased.

On motion, the report was adopted unanimously, and the Secretary instructed to cause a page of the next volume of report to be draped in mourning.

DELEGATE TO THE ANNUAL MEETING OF THE ILLINOIS STATE HORTICULTURAL SOCIETY.

On motion, the Secretary was instructed to issue the credentials of the Society to J. W. Robison, of Towanda, Butler county, as a delegate to represent the Society at the annual meeting of the Illinois State Horticultural Society, to be held at Jacksonville, December 16-18, 1886.

REPORT OF COMMITTEE ON FRUIT EXHIBITED.

The committee on fruit exhibited during the meeting presented the following report:

Your committee report that they find on the exhibition tables the following articles:

By Rev. C. H. Lovejoy, Vinland: Specimens apples—Ben Davis, Ladies' Sweet, Gilpin, May.

By Maj. F. Holsinger, Rosedale: Apples—York Imperial, very fine; Gano, comparatively new; Gen. Lyon, not generally known.

From Stafford county, by C. G. McNeil: Apples—Winesap, Golden Russet, samples of barberry.

By Samuel Reynolds, Lawrence: Apples—Winesap, from trees 30 years old.

By P. Voorhees, Douglas county: Apple—Huntsman's Favorite, very fine.

By E. J. Holman, Leavenworth: Apple—Ridge Pippin.

By G. W. Stearns, Leavenworth: Apple—seedling from Rawle's Genet.

By L. A. Simmons, Wellington, Sumner county: Apples—Winesap, White Winter Pearmain, Dominie, Missouri Pippin, Westfield Seek-no-further, Smith's Cider, a seedling resembling the Broadwell; also one by J. S. Whitman, a seedling of the Rawle's Genet, which is recommended as worthy of dissemination. [NOTE.—This seedling has since been named the "Whitman."—Smo'r.]

By 'Squire Bishop, Emporia, Lyon county: White Winter Pearmain, Smith's Cider, White Pippin, Winesap, Ben Davis, Broadwell.

Lyon county—Americus: Extra specimens of apples—Ben Davis, Smith's Cider, White Pippin, Winesap, White Winter Pearmain; freaks in garden vegetables: Blood Turnip beet, White Brazilian sweet potatoes, white and red sweet potatoes on same vine.

By J. W. Beaver, Ottumwa, Coffey county: Seedling blackberry, recommended by the exhibitor as worthy. The fruit in a glass jar showed large size and good quality.

By M. Hollingsworth, Emporia: Apples—Roman Stem, Rawle's Genet, Milam, White Winter Pearmain, Dominie, Ben Davis, Willow Twig, Winesap, Roxbury Russet.

Lyon county, by W. T. Walters: Apples—White Winter Pearmain, Missouri Pippin, McAfee, Gilpin, Ben Davis, Rawle's Genet, Rome Beauty; and garden vegetables—Yellow Nansemond sweet potato.

Reno county: Apples—Smith's Cider, Winesap, Minkler, White Winter Pearmain, Ben Davis, McAfee, Rawle's Genet, Willow Twig, Stark.

By A. C. Griesa, Lawrence: Can of Keiffer pears, pronounced by the tasting public as excellent.

Johnson county, by Captain E. P. Diehl, Olathe: Apples—Rawle's Genet, from the first trees planted in Kansas, which are now fifty years old and in good health; Newtown Pippin, from same planting and same age; also specimen of wood from the tree, which shows good health.

Greenwood county, by C. Moxley, Eureka: Fine samples of apples—Ben Davis, Missouri Pippin, White Winter Pearmain, McAfee, Willow Twig, Roman Stem.

By J. F. Martin, Winfield: Specimens of a seedling pear known as the "Martin;" size large, flavor good, extra-late keeper; tree reported vigorous, hardy, and of early productiveness.

By J. J. Measer, Hutchinson: An exhibit of well-grown fruit and forest trees.

By L. R. Taylor, Topeka: An exhibit of nursery stock of extraordinary growth, embracing two-year apple trees, one-year cherry, peach, catalpa, and seedling apple and pear stock one year old.

Your committee find two unusually promising seedling apples from Mrs. M. A. Dallas, La Cygne, Linn county, placed on exhibition by our Secretary. We suggest that the Society recommend their dissemination for trial, and that the smallest one be named "Dallas," and the larger one "Linn" in honor of the county in which it originated.

By F. Holsinger, Rosedale: Specimens of Canada thistle; gathered in Chase county, and exhibited for the purpose of informing those in attendance as to the appearance of this dangerous weed, that it may be known when seen, and promptly exterminated.

By I. Horner, Emporia: A fine section of Russian olive tree, nine inches in diameter, grown in McPherson county.

E. J. HOLMAN,
A. C. GRIESA,
A. WILLIS,

Committee.

On motion, the report was adopted, and the Society then adjourned until 7 P. M.

EVENING SESSION.

THURSDAY, December 9, 1886.

The President called the meeting to order, and announced the first exercise, being a lecture on

THE IMPROVEMENT OF KANSAS HOMES.

BY L. HOUK, HUTCHINSON.

Mr. President, Ladies and Gentlemen: Invited by your distinguished Secretary to take part in the exercises of this evening, I do not flatter myself that I shall be able to say anything new or instructive to the members of this great association. I can hardly better explain my relation to this occasion than in the language of another lawyer, addressed more than thirty years ago to the agricultural society of a neighboring State, and under circumstances not very dissimilar to these which surround me:

"It was not my good fortune to start in life in partnership with this fertilizing atmosphere and this teeming earth. My way has been along that path which runs over violated contracts and broken laws; my path, too often darkened by the fierce conflicts of human interest, or the bitter warfare of human passions. My business is to deal with man in strife with his fellow-man, or at war with the government in which he lives. I stand at the point where the antagonisms of society meet; where vice is most active, and frailty most conspicuous; whither human beings, coming from all the diversified pursuits of life, throng in countless numbers, some to have justice awarded them, some to inflict its opposite, and others, an unwilling group, to expiate offenses. My vision has been too much shut out from the broad, bright fields of nature. The laws of vegetable life do not lie within the narrow circle of legal science. Advocates at the bar, judges on the bench, do not teach how a plant must grow, upon what it must be fed, and how, if sickness seize it, it must be cured. They look at soil mainly to determine boundary and title. They do not interrogate the earth to find out its ingredients. They put no questions to the air to discover its elements. The law has its mysteries, but the mysteries of the hail and snow, of the dew and rain, are not of them."

It is rather my humble task, as a layman, to offer some practical suggestions, which may awaken interest in the improvement of our homes, and in some degree stimulate exertion in that direction; and by improvement of our homes, I mean to be understood in the broader sense of the term. It is your higher mission not only to minister as priests at the altar of Nature, to explore her hidden Arcana, and to extract from her the knowledge of the processes by which she creates plant life, and promotes its development, but also, by the application of the principles so obtained, to cause the production of innumerable new forms of beauty and utility; and lastly, to teach how we may preserve all these from the attacks of countless enemies.

To cite two examples out of thousands of the achievements of horticulture: The production by Ricketts by hybridization from two indifferent black grapes like the Hartford and Clinton of the matchless Empire State in all its golden beauty, and the elaboration by cunning florists of the insignificant, single Mexican flower into the glorious dahlia, are nobler works than the Apollo Belvidere, or the great statue of Bartholdi, or the masterpieces of Angelo, and Raphael, and Leonardo.

To have accomplished such things, it may be conceded, does not imply the exercise of creative power, but it does mean the marvelous combination and application of existing forces, which in their results come next to creation. To absolutely create, is a power not vouchsafed to any order of genius. The imagination which scales the highest heaven of invention only arranges and combines the forms and images which are already at hand.

I trust I shall be pardoned this apparent digression; but I could not, in passing, forbear making my respectful obeisance to that large class of workers in the field of horticulture who have added, and are still adding, more to the sum of human enjoyments than any other, and of whose labors too little account is taken by the

majority of mankind. We are too apt to take as a matter of course the luscious, health-giving Brightons, and Delawares, and Genets, and Jonathans, and Bartletts, and Seckels, and Rareripes, and Crescents, and Miners, and Windsor Chiefs, and Kittatinny's, and Cuthberts and Greggs which are placed upon our tables, or, if we give credit at all, to assign it to all-producing and generous Nature.

The radiant ball-room belle borrows more of the subtle charm of her presence from the lovely buds of the Marechal Neill or Safrano which she entwines in her hair, or suspends from her girdle, or carries in her hand, than from the cunningest skill of Worth. She recognizes the indispensableness of such things, but is likely to give herself little thought of their origin, further than that they came from the greenhouse. But few seem to stop to recognize the fact that Nature exacts as the price of her highest favors, not only patient and intelligent toil, but an extensive knowledge of the laws which govern her acts; that the horticulturist must be more than a common-place delver in the soil; that whatever his special field of labor, he must be versed in the sciences of chemistry, of meteorology, and entomology, ornithology, and geology. But happily, Mr. President, the labors of yourself and your co-workers are not unappreciated by all. The thoughtful and the refined give you full recognition as among the most successful promoters of the true, the good, and the beautiful, of this earth.

The incomparable Autocrat of the Breakfast Table has said, "The greatest poems which I have produced in my time are the trees which I have planted along the hill-sides." And another great poet has said, "There is not a plant that springeth but beareth some good to earth."

Approaching now the particular subject which has been assigned to me for this evening, I wish to disavow at the outset any purpose to indulge in sweeping criticism. It does not fall within the scope of my remarks to find fault with even the reasonably well-kept homes which are so abundant in the towns and cities. Wealth and luxury almost as naturally seek expression in well-planted grounds as in fine houses. And then again, the narrow limits which usually belong to the city home make it comparatively easy to redeem such a place from absolute ugliness or repulsiveness. On the other hand, it is not the homes of the poverty-stricken or the worthless which particularly demand our attention, but rather the average home of the land, which belongs to the man who prides himself on amply supplying his family with bread and meat, with clothing and with fuel; who conscientiously refrains from violating the laws of the State, and who regularly with his family attends church on Sunday; the man who would indignantly resent any imputation of not properly tilling his acres, if he is a farmer, or that he fails to diligently prosecute his calling, whatever it may be. These conditions certainly do not define a bad man. Ordinarily, they would sufficiently accredit their possessor as a good citizen and a useful member of society; and yet the fact stands undeniable and confronts us to-day, that the large majority of this class build houses and occupy them, and rear children, without taking any thought to provide many of the essential requisites of a home in its best and truest sense. Houses they may have, more or less commodious, and with the usual accompaniments which render them habitable, and barns likewise to shield the stock from the cold blasts of winter and the fierce heats of summer; and the broad acres may yield their full increase. And yet if this is all, if there is no orchard, no plantation of small fruit to supply their luscious stores to the family in season, no plat devoted to the cultivation of flowers, no shrubbery, no evergreen or other ornamental trees, nothing but the inevitable patch of cottonwoods; if there is no spot held sacred from the inroads of the predatory pig; if where should be the green and smiling lawn, the shrubbery, the well-laid-out and trim garden, sun-

flowers and other noxious weeds should be left in undisputed possession of the soil to run riot, is such a life worth living?

Let it be cheerfully conceded that the number is small who never make any attempts to plant orchards, and yet there are some. A part fail to do so apparently from utter indifference, others, because it is too long to wait for the fruition of their labors. It will be years, they tell us, before the trees would yield us any fruit, and in the meantime death may intervene. The far larger class seem to recognize some necessity for acting. They occasionally buy trees and vines from the peripatetic tree-peddler, giving no particular attention to the condition in which they are received, and with no accurate or reliable information as to the varieties which they are buying.

At the next important stage, namely that of planting, little or no care is given to the preparation of the soil; holes are dug too often of a size to receive posts rather than trees; the roots are crowded together promiscuously, and the work is hurried to completion as rapidly as possible so as not to interfere with other labors supposed to be more important. Trees planted in this slipshod and slovenly manner are left, the first season, to eke out a precarious life, if they survive at all, contending for existence with the rank weeds and grass, which dispute their possession. At the end of the first season a part of the survivors fall victims to depredating stock, others are girdled by rabbits, and the remainder at the opening of the ensuing spring, enfeebled by ill-usage, yield to the mysterious force of nature and commence another year's growth, and if they do not finally succumb to the effects of sun-scauld and consequent decay, and are not destroyed by subsequent accident, continue to live, and in the course of a few years, though gnarled, twisted, and bent, and dwarfed in size, yield their scanty supply of fruit. A few half-hearted attempts may be made to replant, with not greatly differing results, but usually such a planter yields to disappointment, and attributes his failure to what he calls his bad luck, and apparently never waking to the knowledge that Nature is not a hard task-mistress, but that she is our generous nursing mother, who bestows the richest rewards upon sustained and well-directed effort.

There is a third, and fortunately much larger class, which is not liable to such animadversions as these. It is composed of men, of practical men, who could not tolerate life under the conditions just described, and with such bald, bleak and storm-swept surroundings. These men plant wind-breaks, and especially for the animals belonging to the place. They recognize the supreme necessity of fruit. They know that they must plant and successfully grow apples, and plums, and cherries, and grapes, and that to these must be added berries even, and that all this must be done as a condition of good health, as well as to minister to pleasure.

In all probability most of them have not advanced far enough to consult the transactions of the State Horticultural Society, in order to ascertain what experience has demonstrated as to the proper varieties to be chosen for quality, hardiness, profuse bearing, and general adaptability to the conditions surrounding them; but at any rate they purchase trees, and endeavor to see that they are in fair condition; they plant them, and give them reasonably good care, and sooner or later they have a greater or less reward in fruit. They plant the inevitable Concord vine, and that generous iron-clad soon yields its rich harvest, during its short season. And the seedling peach is not apt to be forgotten; these are planted, recognizing the fact that before the combined ravages of borers and the extreme vicissitudes of the seasons shall destroy the trees, that mayhap two or three crops of fruit, some of it possibly of the highest quality, may be gathered, leaving in the end the dead trees to pay in fuel for the comparatively little space which has been occupied. Blackberries and

raspberries, and not unfrequently a modest patch of strawberries, receive their share of attention, and doubly repay the trouble and expense. And possibly, not having the fear of fire-blight before them, a few pears are ventured upon. But at this point, and with the severely useful, that is, with that which ministers to the daily wants and makes up a part of each meal, all interest in horticulture ceases. Beyond the narrow limits of the supply of the daily animal wants, these people do not suffer themselves to look. Seemingly it has never dawned on them, that humanity's daily food should be more than that which supplies the body; that we are gifted with high faculties which demand the presence of the beautiful, and that the All-Wise Dispenser of Good has provided for their fullest gratification. Wordsworth had such a man in his mind when he wrote—

"A yellow primrose by the river's brim,
A yellow primrose is to him;
And nothing more."

To all these it is my purpose to address a few words of admonition. To those whose vision is so contracted that they have yet to learn the importance of fruit-planting, I would say, "Awake from your lethargy, and do not delay longer. It will richly repay you in dollars and cents."

A distinguished pomologist, after long years of practical experience, has declared that the annual growth of every well-cared-for young apple orchard is worth in money one dollar for each tree. According to this estimate, which does not seem to be extravagant, an orchard of ten acres, allowing fifty trees to an acre, enriches its owner five hundred dollars a year, commencing from the very time of planting. Can an equal amount of ground be as profitably applied in the production of any ordinary farm crop, even with a much greater expenditure of labor?

But let it be supposed that no substantial advantage has been gained until the actual fruit-bearing stage is reached: how rich and ample is the reward! For the family, what an exhaustless mine alike of health and enjoyment! For the housewife, what a resource in the production of wholesome and appetizing dishes! For the youngsters, what an abounding joy! But who shall fitly sound the praises of the apple? In view of its paramount utility it forms no mean part of the world's commerce; and the improved evaporating processes of to-day give the orchardist the command of all markets for his products. Its origin seems to be almost coëval with that of man; and the remotest history mentions it. The metaphorical language of Holy Writ makes it the temptation which caused the fall of our first parents and of the whole race. The golden apple of the Hesperides was the fabled cause which created that web of circumstances which in turn formed the theme of the greatest epic poem in ancient times, if not of all times. I am not attempting an anti-climax when I remind you that Dr. Samuel Johnson, the foremost man of the eighteenth century, asserts that he knew of an English clergyman who reared a large and interesting family on apple dumplings.

It must not be understood that only the planting of apples is insisted upon. Of course the apple stands preëminent, but out of the unending variety which nature places at our disposal, other things must also be selected. Cherries must be planted, giving the preference to the Early Richmond and other varieties of the hardy Morello family. The Dukes must not be wholly neglected; but for this climate, plant still more sparingly of the Bigarreaus and Hearts, if at all.

Plums are an important crop; especially the improved Chickasaws, like the Mariana and Wild Goose; and the descendants of the wild plum, like the Minor.

Pears must not be omitted, notwithstanding the obstacles in the way of their successful growth, and the long time before coming into full bearing. The deadly fire-blight too frequently interposes and defeats the hopes of the orchardist. And

yet we must have this matchless fruit, for there is nothing better out of Paradise than a melting Seckel, or Belle Lucrative, or than many others that might be named.

The peach, too, not inaptly called the queen of fruits, must come in for some share of attention. The severity of our winter climate and the ravages of the insidious borers forbid any great expectations by ordinary cultivators from this source, except at rather prolonged intervals. But the peach is, nevertheless, indispensable. If the fine sorts and budded varieties cannot be planted, at least plant seeds, and especially of such as closely follow the original variety when grown from seed, among which may be named the Heath and Lemon Clings and the Indian or Blood varieties.

The apricot, too, which used to be supposed to be wholly unreliable on account of its habit of early blooming in the spring, is now placed within our reach by the introduction of the Russian varieties.

Following next in the order of arrangement adopted, but in fact second only in importance to the apple, comes the grape. It has been known and honored in all ages and climes. The spies who went in advance to explore the promised land, returned bearing with them to the expectant children of Israel the fruit of the vine. And in all the succeeding ages, it has never failed of recognition as one of the most priceless gifts of a beneficent Providence. Among its numerous good qualities, it may be mentioned that the vine requires comparatively little space; it comes quickly into bearing, usually yielding its delicious fruit the second year after planting, and is not only one of the prime luxuries of the table, but according to eminent physiologists, the use of no fruit is more conducive to the health, regularity and vigor of the human system. To us the privilege is denied of successfully growing the wine-bearing grapes of Europe and Asia—the world-renowned grapes of sacred and profane history and of poetry—at least in the open air; but our hardy American varieties leave but little to regret on account of this privation. And may we not even flatter ourselves that some part of the Revolutionary debt due to our Gallic fellow-republicans has been repaid by supplying to them the means of restoring their phylloxera-stricken vines?

The range of reliable varieties within reach of one desiring to plant, is practically illimitable. I can only stop to suggest a few. The Concord, Worden, Moore's Early, Early Victor, (the last named a product of our own State,) Pocklington, Lady, Perkins, Vergennes—all iron-clads—will all endure much neglect, but if given generous treatment will repay the cost twenty fold. My limited experience and observation, with what I have heard and read, lead me to strongly commend some of the varieties of the so-called *Riparia* class, as Etta, Elvira, Noah, Montefiore, Grein's Golden, Faith, etc., the first and second promising to successfully rival even the Concord. They seem to be as hardy as the hardiest, are fruitful, are free from hard pulp, and of most excellent flavor, the Montefiore having much of the high qualities of the better varieties of the *estivalis* species, and is simply delicious. To those who insist on having something better than any of these, and partaking of the meaty quality of the foreign sorts, a large number of varieties may be suggested for limited cultivation, among which are the Lady Washington, El Dorado, Brighton, Delaware, Duchess, and Jefferson. All of these, to my knowledge, have stood unscathed with the mercury at 25 degrees below zero. They are of surpassing excellence, and the last named three are now believed to be free from any trace of foreign blood, and even the Delaware has been free from mildew. I must not omit in this connection, two others, which give promise of taking the highest rank for hardness, beauty and long-keeping, and very high rank as to quality. I mean the Empire State and Niagara. The latter, as I have seen it in the vineyard of my friend Mr. D. M. Wright, of Hutchinson, is certainly magnificent.

I will only add on this subject, that many of the kinds named can be kept through the winter in perfect condition. I have seen the Etta hanging on the vines almost like the Cordifolia or wild frost grape.

The other small fruits are a matter of course; they may not all be entitled to the praise bestowed on one by quaint old Boteler, who said: "Doubtless God Almighty might have made something better than the strawberry, but doubtless he never did." Nevertheless, they are indispensable in the family economy, and a failure to plant these freely is inexcusable.

Before passing from this subject of fruit-growing, I wish to urge specially that those who plant, should learn to be in some measure independent of the nurseryman. Let each learn for himself the arts of budding and grafting, and not only himself, but the children. The processes are simple and easily acquired. The young folks will readily take to the work and with an ever-increasing pleasure. The trees with which they thus become so closely connected will be ever afterwards familiar friends and companions, and will give added charms to home life.

I cannot pass from the subject of fruit-growing as a means of home improvement without one more suggestion; and this, like all else which I have to say, is addressed not to skilled orchardists and others who are already well informed, but to the great mass of people who have given little study or thought to pomology. The obvious suggestion referred to is, that in order to attain success, not only must the requisite labor be given, but that sufficient and suitable ground must be ungrudgingly devoted to the purposes indicated. We must not indulge any such delusions as that any neglected or out-of-the-way nook or corner will be sufficient. Fruit-raising even for the family, is not a mere trifling incident, but a matter of the utmost importance.

There is another topic remaining to be considered, which must not be taken to be of less importance because reserved to the last. It is needless to say that I refer to the obligation which rests upon all men having homes, to do what they can to render their surroundings attractive and beautiful. I speak not of the aids which only the free use of money can give, not of stately mansions nor of the landscape gardener's art, but rather of the use of those resources not pertaining specially to the rich but free to all. There are those whose souls are so dead to all that is beautiful in Nature, so incorrigibly joined to their slothfulness and apathy, that it would be casting pearls before swine to make appeals to them. To that larger number, who have failed in their duty from a supposed want of time, or from the pressure of other cares and responsibilities held to be paramount, I have a few words to say.

The conflict between your duty to your homes and your supposed weightier duties is more apparent than real. The truth is, that almost every man uselessly fritters away time which, if employed in the right direction, might make of his home a blooming Eden. Besides, no man will be left to labor alone, when laboring to this end; willing hearts and hands will be around to assist and to cheer.

Let us now suppose that a beginning is to be made by one having ample space at command. Obviously, the first thing will be to adopt some general plan and lay off the grounds in accordance with it, not with a view to expensive and elaborate gravel walks, unless the owner's means warrant a considerable outlay, but a simple plan, with few walks.

First, there must be grass, a lawn of greater or less extent, for there is no object in nature more agreeable to the eye than an expanse of green grass. If a good supply of water is not available, it may not be best to choose the Kentucky blue-grass, and if not, then white clover and other substitutes must be found.

As to preparation of the soil, I decline to make any recommendation, for while I have reasonably satisfactory results from deep stirring and careful preparation,

others maintain that there is no better way than to sow the seed on the hard ground. While apparently supported by a fair show of success, let this point, then, be determined by the particular circumstances of each person. The lawn will, of course, not be devoted to grass alone; it may be desirable that its continuity be broken by trees, shrubs, and flower-beds. But these, although not to be regarded as intruders, must be sparingly used, and in subordination to at least two rules: one, that you must not cut up your lawns into little bits by trees and shrubs; and the other, that if you have a pretty view in any direction you must not obstruct it by trees. Possibly, a third may be followed profitably, namely, the trees and shrubs should be massed only near the outer borders. To my taste, no more delightful object could appear on the lawn than one or two of the handsome cut-leaved or weeping trees, such as the birch, or dogwood, or linden, or even a willow. Coarse-growing varieties should be sedulously excluded. As to shrubs, there is no dearth of hardy and beautiful varieties from which to choose. The lilacs, spireas, wigelias, *Philadelphus*, upright honeysuckle, *hydrangeas*, *deutzias*, the Japan quince, and many others, all hardy and reliable, are at our command. To these must be added the unquestioned queen of the flowery kingdom, the rose.

The list to be planted would be very incomplete without evergreens. These, like other trees, may be grouped at suitable places, or planted as single specimens, and with the best effect. Here again, it is not easy to go amiss in choosing varieties. The Austrian and black pine, Norway spruce, *arborvitæ*, red cedar, and others, are all thoroughly at home in our State. A hedge-row of the latter, in front of the lawn, as it may be trimmed to almost any shape, to suit one's taste or fancy, can be made a thing of beauty.

There can be no more splendid spectacle than a continuous row of hybrid perpetual roses, either of mingled varieties or of a single kind, flanking the lawn on one side. This may serve the additional purpose of shutting off the view of unsightly objects. I may say from experience, that for this purpose the Gen. Jacqueminot is an admirable sort; but others, like the Dr. Hogg, Madam, Chas. Wood, Coquett de Blanchés, may be nearly or quite as good. By cutting low and throwing up a little earth with a plow, they will withstand our severest weather.

The purple berberry used as a hedge, between the front and back yards, by its splendid purple foliage, contrasting with the various shades of green around, is a striking and beautiful object; and the same may be said of the *Pyrus japonica* or Japan quince; and probably a number of other shrubs are just as desirable in this way.

But thus far we have failed to touch on one class of ornamental plants which are certainly of the first importance — vines or creepers. These bear the closest relation of all to the houses in which we live, and by their graceful habit of growth, possess a peculiar charm which is all their own. They should be freely planted about the house, and allowed to clamber over the porches with their graceful festoons, being alike delightful for their grateful shade and their loveliness. Of these the honeysuckles, clematis (meaning the Virgin's Bower and the older sorts, and not having any special reference to the splendid array of newer and costlier varieties), bignonia, and wistaria, are well-known favorites. I would not confine the planting of these to the immediate vicinity of the house. They merit the distinction of being planted to themselves upon a trellis of their own, and nothing can be more pleasing than the dense mass of foliage and flowers which they present, and especially the bignonia.

It cannot but be observed that in all this, I have sought only to give hints as to what may be accomplished. I think it must be equally apparent that with a fair display of diligence and industry it is not beyond the reach of people of ordinary means to compass a satisfactory measure of success in home adornment. The willing learner

can easily obtain access to sources from which he may gain the fullest information on every point.

It only remains for me to point the moral. The home is the natural abode of peace, and joy, and love. There the gentler affections of our nature should find their fullest exercise. The most sacred office of such a place is by its pleasing associations, and its refining influences, to bind the youth who have been reared within its precincts to the good, the true and the tender. Let the memory of home to our sons and daughters, going out into life, be that of the place where the sunshine is brighter than elsewhere on earth, where the air is balmy, and where the songs of birds fall most sweetly on the ear, and where every shrub and flower and every object of beauty is recalled as a dear and well-remembered friend; where every tree, standing with arms outstretched, mutely invites the wanderer's return.

In conclusion, my friends, such homes can never be recruiting-places for our States' prisons. They are rather the nurseries in which are to be grown the men and women who must be looked to as the hope of the Republic in the coming years.

At the close of the address, on motion, the hearty thanks of the Society were tendered to the lecturer for his very kind and able effort to aid in promoting the success of the meeting.

FINAL RESOLUTIONS.

The Committee on Final Resolutions announced its report was ready, and being called for, was as follows:

Resolved, That we, the members of the Kansas State Horticultural Society, hereby express our earnest thanks to the Lyon County Horticultural Society and the citizens of Emporia for the very kind reception and friendly treatment of the Society during this meeting.

Resolved, That we sincerely appreciate the kind attention given the Society by the President, A. R. Taylor, and the teachers associated with him, of the State Normal School, and hereby express to them our grateful feelings.

Resolved, That we thank the Yazoo Club of Emporia, for kindly consenting to furnish excellent and enlivening music during the evening sessions. And furthermore,

Resolved, That to the Bristol Sisters, of Topeka, we express our gratitude for the beautiful bouquet presented, and which so admirably adorns the President's desk.

On motion, the report was adopted, and the President, with a few appropriate remarks, closed the twentieth annual meeting.

APPENDIX.

FORESTRY DEPARTMENT.

REPORT OF STANDING COMMITTEE.

BY M. ALLEN, HAYS CITY.

One hundred years ago this great country had only a few people—about four and one-half per cent. of what it now has. These were mainly scattered along the Atlantic coast. None, or at least almost none, of the interior had then been explored. It was supposed to be one dense forest, which was then looked upon as man's greatest enemy, because, in order to draw sustenance from the earth, the forest must first be displaced or destroyed. The very subsistence and existence of this people seemed to depend upon the destruction of the forests.

The people, following and most faithfully fulfilling what they supposed to be a most sacred duty, cleared their lands, raised their children and instructed them so well and carefully in this art, that in some cases the noble trees thus destroyed, if left standing would now be worth more in dollars and cents than the land on which they grew and all the crops which have been raised on it, to say nothing of all the toil in destroying the one and cultivating the other.

He was, no doubt, an expert and thoroughbred in this line who, within the last year, came from the east to western Kansas to take a timber claim, being under the misapprehension that he would have to clear ten acres instead of plant trees over this, and he brought a complete outfit for clearing land, including a stump-puller, to a locality where there was and never was either trees or stumps.

The woodman's ax has done its work, until but seventeen per cent. of the original forests of Ohio now remain, and one acre of forest is worth two or three acres of cleared land of equal quality. The same is also true of other localities in the Middle States.

So fearful has been the waste, that zealous and public-spirited men have sought to arrest it. They have organized the American Forestry Congress, that has done and is doing much good. This body has appealed to the Congress of the United States and obtained a commission to gather statistics, and to tell us where the forests that are now left are located, and the sorts of trees they consist of, and the rate of their destruction in various quarters by clearing land upon which to conduct agricultural pursuits, by saw-mill men, ship-builders, miners, forest fires, etc.

Laws have also been enacted in some of the States providing for gathering more fully statistics and other information of their own, and encouraging the preservation of the timber they have left. This has been the case in both Ohio and New York, fine reports of which have been put into my hands, for which I heartily thank the donors.

The State of Colorado, our neighbor on the west, has also been active, and has done some good work in this direction, mainly with a view to prevention of forest

fires, a preservation of the timber on the mountain-sides and thereby a more careful husbanding of their perpetual snows, and through them a greater assurance and longer continuance of their water supply. These are all matters well worthy the attention of such a body as this Forestry Congress.

While the wanton destruction has been going on in the East, and the mines of the West were being developed, the population of this country has gone on from three to sixty millions; the prairies have been discovered, and their great fertility demonstrated; Kansas, Nebraska and Colorado have been organized, and have attracted such attention that they probably now contain nearly as many people as the whole Nation did a hundred years ago. Out of these three States might now be carved another, as large as Ohio, Indiana, Illinois, Iowa, or even Missouri, already numbering its people by tens of thousands, that has not to-day enough timber in it to make fire-wood alone for its present inhabitants (if they should be confined to it alone) for this winter. This territory seems not to have yet been discovered by the American Forestry Congress—I suppose largely for the reason that their efforts are mainly directed to the preservation of forests where they already exist. They are mainly not prairie men. The most important thing that has been done to encourage planting in this vast region, in the way of legislation, was before this Forestry Congress existed, and is known as the timber-culture act of Congress, which was enacted thirteen or fourteen years ago, and amended so as to make it more practical two or three years later. Great good has resulted from this law, but not what was expected, either by those making it or by its patrons. It has resulted in teaching forestry negatively. While we have been anxious learners, and wanted help and knowledge as to what, where, when and how to plant, we have had no direct help from either our law-givers or this Forestry Congress upon these very vital points. But our actual experience with and under this timber-culture law, if not productive of much real success, has taught us *how* and *what not to do*, and has furnished the actual experience in the field, out of which real success will most likely be evolved. This law has developed an experience which, to us upon the plains, may become valuable as a light-house is to a mariner in a strange sea, beset with treacherous rocks.

Very *unfortunately* for our plains region, there is a great effort being made for the repeal of this law. The fear of its repeal is creating much distrust among its patrons—there is nothing so insecure as uncertainty. Partly upon this ground has our Congressman in the Sixth District been retired, and a homesteader supposed to be more in sympathy with the people put in his place. We have a United States Senator, a very brilliant one, that has done himself great discredit by advocating the repeal of this law, and being one of the first to do so. It is the only help we plainsmen have had at the hands of legislators, and now the politicians propose to rob us of this by crying fraud.

Last summer, I had a very timely invitation to meet with the American Forestry Congress at its September meeting in Denver. I was also informed that our State would be entitled to three commissioners in that body, to be appointed by the Governor. He, however, in his wisdom, in a great measure ignored tree men, and put mostly newspaper men upon this commission. Our railroads, probably looking to immediate results instead of the future, and caring more for the present carrying trade than for the future development of the country, extended no courtesies to any one on account of this meeting. I mean especially the Kansas Pacific Railroad, for of the others I do not know so positively. But by the timely aid of this Society I was furnished with such credentials as entitled me to a favorable recognition in that body of gentlemen, which was composed of three quite distinct classes of persons, or at least lookers-on from three different and quite distinct standpoints, viz.:

The gentlemen from the East, looking almost entirely to the preservation of the forests they have left; the Rocky Mountain gentlemen, interested in preserving their timber mostly for the purpose of prolonging their snows and water supply, without which they have neither agriculture nor horticulture; and the gentlemen from the plains of Kansas and Nebraska, who could see great hope in the timber-culture law. They had no trees but what they had planted, and wished to retain all the aid in sight to encourage further planting; therefore they urged a resolution against the repeal of the timber-culture law. These Nebraska men were all tree men, and had been carried free by their railroads. They, with all the Kansas men who were in voting trim, favored this resolution, as did Mr. Byers, editor of the old *Rocky Mountain News*. Upon the yeas and nays being called for by a gentleman from Nebraska, the resolution was lost. I recently asked Mr. Fernow, the secretary, for the yeas and nays, and in answer he says he is "not in possession of the record," but adds: "I know that I voted against, and mostly Colorado people with me. Nor have I seen reason to change my views; but I would not want the timber-culture act abolished without putting in some substitute, making timber-planting a condition, or at least an aid of homesteading. 'I also advocate Government planting on extensive scale.'"

Verily it seems to me a long stride backwards to advocate the repeal of a law providing for the planting ten-acre lots of trees scattered all over the plains, into every part of each township, and expect to substitute therefor, sometime in the future, a scheme to plant large bodies of timber in wide-apart places by the Government. No! gentlemen of the American Forestry Congress, please do not take from us what we already have, with the promise that you may sometime help us to get something of much less value. Confine your attentions to the preservation of the timber still left in the timber States—but with us, where we have no trees, and never had—if you can't tell us how to plant and grow them, please *let us alone*. We, upon the plains, want and ought to have one or two, or possibly more, experimental stations from which reliable information for the localities where they existed could be readily obtained upon all subjects relating to forestry, or rather the planting and management of trees for the production of timber. Our State can do no better thing than to help itself in this way, by making suitable appropriations for this purpose.

Another thing is just now giving many of our timber claimants much anxiety; it may be stated thus: The party recently coming into power, fully believing, no doubt, that great frauds had been committed by their predecessors, in various departments of the government, in their zeal to find such frauds, and bring them to public notice—if not to justice—have sent out squads of agents, commissioners, etc. The heads of departments have made strange and unprecedented rulings, under the seeming apprehension that their duties were legislative and judicial, while they in fact were only ministerial and declaratory of law, to wit: The Commissioner of the General Land Office, proceeding no doubt more from ignorance than evil intent, has made a ruling that the *Osage Orange* is not a timber tree, and therefore will not be admitted for planting upon timber claims. And now comes one of these agents, and under his influence, advice and consent, several timber claims are now under contest, for the reason that *Osage Orange* alone has been planted upon them.

If this functionary has the right to proscribe the *Osage Orange* (which he has already done), he has the right to proscribe other sorts as well; and suppose he should next year proscribe the Ash, and the year following he might have a successor, following the precedent thus established, who might under this law, in the course of three or four years, render it entirely inoperative and void, simply by the imbecile administration of it.

The timber-culture and preëmption laws were both for a time suspended by action

of the Commissioner of the General Land Office, under the belief that the last session of Congress would repeal them.

In this, my eighth annual report to you, I have departed widely from the usual rule, not without believing, however, that the signs of the times fully warrant such a course. In conclusion, however, I want to say that while the early part of the past season was somewhat dry, almost too much so for newly-planted trees, the wood-growth has been heavy and quite satisfactory.

RESULTS OF FOREST-TREE EXPERIMENTS AT THE COLLEGE FARM.

BY EDWIN A. POPENOE,

Professor of Horticulture and Entomology, Agricultural College, Manhattan.

MR. PRESIDENT: Having been requested by your Secretary to give you the results of forestry experiments at the State Agricultural College, I have thought that my observations upon the present state of the forest plantations might gain in interest if, by way of their introduction, were read a few extracts from the early reports to the Regents, of Prof. Gale, then Superintendent of the Department of Horticulture at the College. These extracts recount the early history of the groves in question, and serve to show the successes and vicissitudes of the plantation in its beginning, a knowledge of which is necessary to the understanding of the results as gathered to-day. I quote from the report for 1872:

"The land selected for this purpose was that least adapted to the cultivation of cereals, or root crops, of any now broken upon the College farm. This selection, all things considered, was thought best, for it is in general this quality of soil—the high, gravelly, broken ridges—which should ultimately be planted to forests. It is, then, a matter of interest to learn what may be expected as the result of forest culture on such exposed situations as the one selected. As was anticipated, the growth of the young trees has not been so vigorous here as it would have been upon lower and richer land, but still abundantly sufficient to give the most encouraging promise of future success. The planting this year consisted of European Larch, White Ash, Red Ash, Green Ash, Osage Orange, Catalpa (Bignonioides), Ailantus, Black Walnut, White Hickory, White Maple, and Willow.

"Of the European Larch planted, 50 per cent. died, most of them after the first of July. The White Ash, one-year seedlings, have grown from two to three feet. The White and Red Ash seed failed to germinate. The Green Ash have grown from twelve to twenty inches from seed. Osage Orange was planted with special reference to forest culture. The seeds of Ailantus were purposely planted upon the highest and driest ground, some of it gravelly, from the belief that this tree, with its tendency to a late, succulent growth, will be hardy upon such a soil if at all in Kansas. The growth of this tree, so far, will justify further experiments. The Catalpa has made a growth of twelve to twenty inches.

"Cuttings of about eighty varieties of Willow were planted, and about sixty varieties lived. A small number of these present a promising appearance, having grown from four to six feet. A native Willow, which is found occasionally along our streams, has also been planted upon our uplands for testing its availability for general forest culture, and so far it promises well."

From the report of 1874:

"Among those trees that are making a good growth upon upland may be mentioned the Catalpa, Silver Maple, Osage Orange, White Ash, Green Ash, Ailantus, Black Walnut, common Cottonwood, and Lombardy Poplar. It is worthy of remark that the Ailantus has made a good growth upon the driest land that we have, and in such situations has suffered very little from the winter, while upon rich bottom lands it is only half-hardy.

"The European Larch, after repeated trials, has not proved a success. The same may be said of the Birches, Beech, and with some slight modification, of the Sugar Maple and American Chestnut. . . . This year has been one of peculiar disaster. [Referring to the invasion of locusts.] Evergreens of most varieties have suffered materially, where they have not been killed by defoliation. The

only evergreens that have entirely escaped the grasshopper are the Red Cedar, Mountain Pine, and Pitch Pine. The Austrian Pine was partially defoliated, while the Scotch Pine, Norway Spruce, Irish Juniper, and American Arborvitæ, were nearly all ruined."

From the report of 1875:

"The evergreens in the nursery, which in part or wholly escaped the locusts, are the Austrian Pine, Table Mountain Pine, American Spruce, and Red Cedar. But all very small evergreens, and those of all sizes recently transplanted, perished. That portion of the forest devoted to deciduous trees came through last season [the grasshopper year] with comparatively little injury. The most marked exceptions to this were the European Larch and the American Chestnut. The former of these perished entirely, while the latter can be scarcely counted better than dead.

"The evergreen trees [in the forest] were mostly killed; the only exception to this is the Austrian Pine."

The present status of the experiment may be shown by the following notes.

The White Ash plantation stands in the best part of the poor land occupied by the entire grove, being in a slight depression heading a small ravine, and facing the south. The trees originally stood in rows about five feet apart.

Four years ago, in response to an apparent demand for thinning, trees were cut at such intervals as to allow those remaining to stand at about seven or eight feet apart. The trees cut out, trimmed and seasoned, furnished poles of great value for many purposes, being straight and tough, while some used as fuel proved equal in this regard to the best wood in our markets. Measurements with a tape-line, at four feet from the ground, give as an average of twenty-five specimens, taken in succession while walking across the plantation, a circumference of thirteen and a fraction inches. Seven of this number exceeded a diameter of five inches at the height given. These trees stand over twenty-five feet high, straight, and usually without forks. Ninety per cent. of them will furnish now serviceable poles twenty feet in length.

The undergrowth is light, and is composed of sprouts from the stumps of the trees cut out, with a number of raspberry, gooseberry and coral-berry vines, doubtless planted by the birds that frequent the groves in great numbers during the breeding season. There is but little herbage, and that mostly a thin grass and woodland weed.

The Osage Orange plantation stands as first made, trees three to four feet apart in rows, and rows four feet apart. No systematic thinning has been made. The trees average over twenty feet in height, and, as shown by measurement at a height of one foot from the ground, over ten inches in circumference. As will be understood, they are much more generally branched low, and the trunks often divided at the height of one foot from the ground. The lower branches do not so readily kill out by shading as in other trees. There is no undergrowth except where gaps occur in the plantation. At this size, the timber has little value save as poles for use in the garden or vineyard, in which service, however, they cannot be equaled, if cut while growing, and stripped of their bark before seasoning.

The White Maple is growing on about as high ground as the plantation site affords, but owing to the natural protection of the closely-planted trees, this grove, on a sterile southern slope, shows an excellent growth. The trees stood originally about four feet apart each way, but were thinned four years ago to eight feet apart. They are now over thirty feet high, with straight, unbranched trunks, and show an average girth of over fifteen inches at four feet from the ground. At least 95 per cent. of the trees would furnish straight poles over twenty feet long. The undergrowth is less abundant than in the Ash grove, and is composed of about the same vegetation. A small number of the trees, some even in the thickest part of the grove, show on their southwest sides the effects of sun-scalds, and the work of flat-headed borers.

The Catalpa, upon equally poor ground with the White Maple, has also made a

very satisfactory growth. The tree is less straight, and more large branches survive, dividing the trunk, and rendering it less valuable as timber at this stage of growth than it would otherwise be, but considering the high quality of the wood for certain purposes, we should rate the Catalpa at this age, in our forest plantation, second only to the White Ash. The trees seem to be mostly of the Western Hardy variety, though catalogued in the report above quoted as "bignonioides." They appear to have been planted at irregular distances in the row, and quite closely, so that now trees three or four inches in diameter stand half a dozen together at distances of eighteen inches from each other. This grove has received no systematic thinning, though posts and poles have been cut here and there. There is practically no underbrush, only sprouts from stumps of trees cut out. At the height of four feet, the trees have an average circumference of fifteen inches or over, the largest being twenty-two inches, and a height of twenty-five feet.

The Ailantus grove, on the highest ground, is now a thicket of stems of all sizes down to last year's sprouts. The trees have not been thinned out, and were evidently planted at about four by five feet, though the rows are filled up by sprouts, some of which are nearly as large as the original seedling. The trees selected as the oldest in the grove, average eighteen feet high, and have a girth at four feet from the ground of eleven inches. On the outskirts of the grove, an occasional tree may be found having twice this circumference. There is no undergrowth in this grove, excepting Ailantus sprouts.

The Black Walnut grove stands as planted, about four by four feet apart; have made a clean, straight growth, averaging over fifteen feet high, and at four feet from the ground, eight inches in circumference. The plantation never having been thinned, the close stand has resulted already in the death and decay of all the branches on the lower part of the trunk, promising straight timber when of larger size. A second plantation, apparently about three years younger, shows this process of self-pruning in progress. These trees, standing four by one and a half feet apart, averaging twelve feet in height, and one and a half inches in diameter at four feet from the ground, carry no live branches below a height of about six feet, though the trunks are set with dead ones nearly ready to fall, through a decay of the branches near the base. The undergrowth of this grove consists of wire-grass, golden rod and sumac.

In marked contrast to the self-pruning Black Walnuts, stands the Ash-leaved Maple alongside. Planted at the same time and same distance, these trees, sixteen feet high, and at a height of four feet, are two inches in diameter. Yet the numerous branches and sprouts from their base are mostly as fresh as those above.

Trees of the Green Ash, of same age and planted equally close and adjoining the Ash-leaved Maple, are two or three feet higher, and have a diameter of two inches at a height of four feet. On these the branches on the lower part of the trunks are all dead and ready to drop. As in the White Ash and Black Walnut groves, these trees are remarkably straight and clean in growth. There is practically no undergrowth in this grove.

If I were asked, after a walk through these groves, to select from the list the three that seemed on the present evidence to be best worth a further and extended planting on such soil with a view to earliest profit, I think I should name the White Ash, the Catalpa, and White Maple. The evidence of neighboring plantations shows the equal importance of the Black Walnut on lower and richer soil, and may even on the sterile hills become some day of useful size. I cannot speak very favorably of the Ailantus, so far as I may judge from the present plantation, except to mention its very evident ability to maintain a succession of growths after the ground is once planted. It would seem that the Osage Orange and Catalpa would be much

better if watched and low forking prevented by pruning, than if allowed to grow unpruned like the Ashes and Walnut.

Finally, the results so far given in these groves we have been considering, affirm the soundness of the argument advanced by Prof. Gale, when in beginning these plantations he insisted upon close planting as the surest means of procuring, at little expense of care and cultivation, a useful growth of timber.

THE FOREST AS A SOURCE OF PERPETUAL NATIONAL REVENUE.

BY PROF. E. GALE,
Ex-President of the Society, Lake Worth, Fla.

The forest is a source of great national income. Millions of our people in one way or another live upon its products. All of our people draw more or less revenue from the forest. While it feeds and clothes so many, we scarcely realize how its products enter into nearly all the industrial pursuits of civilized life. Were its products to be even largely curtailed, there is not a village in the land but would have its breadless and houseless families. It is not easy to realize the vastness of the forest products, because they are so evenly distributed among all classes of our people. This universal distribution adds greatly to the importance of our forest interest. The song once told us that cotton was king. Then came the response from the North, "Corn is king." But if we study the statistician's figures, we may hear the trees from Maine to Oregon, and from the Lakes to the Gulf, murmuring in unison, *The forest is king.*

The products of the forest are estimated in round numbers at \$700,000,000. The corn crop of 1880 was estimated at \$679,000,000; wheat at \$474,000,000; hay at \$371,000,000; cotton at \$280,000,000; and the products of all the mines of gold, silver, iron, copper, lead, and zinc, at \$106,000,000, or a little more than one-seventh of the product of the forest. There is, then, no single source of revenue that equals the revenue of the forest. Now is this immense interest to be regarded as only transient, a stepping-stone to something else, or is it to be viewed as a perennial source of national wealth? Reason points to the latter view. But to our bedimmed faith the actual profit is too far away, and so we find ourselves urging, legitimately it is true, forest protection and every other plea, before we can stand up with our arms full of the little trees, and tell of the profitable crop that somebody may reap from their growth, twenty, thirty or fifty years hence. We hardly dare to say that there will, by-and-by, be money in these little whips which to-day we carry a-field in our arms by the hundred; and yet it is true, but it stirs no enthusiasm. And why? Is it because we feel that it is a crop planted for our children and not for ourselves? It may be that we are not unlike the Irishman who would do nothing for posterity because posterity had done nothing for him. Whether we or our children reap any immediate advantage from personal efforts in forest culture, is a matter of very little moment beside the interest of a nation. And yet there is no doubt but that intelligent forest culture on the great treeless plains will greatly advance our personal interest, as well as vastly increase the wealth of the region to which we devote our energies. While we may not forget our own personal interests, while we may accept the fact that we are co-laborers in providing favorable climatic changes,

we ought to realize that we have here a great national interest. We should not leave the gleanings of the American forests for our children, but so handle this great national interest that the products of the forest for coming years shall be more ample, richer in variety, and better suited to the wants of a perfected civilization, than are the products of to-day. This may be thought asking much, and yet it is not too much, if we can supplant the haphazard practices of the present by a suitable system of forestry. We should aim, first of all, to so conduct this vast interest that the products of the forest as a whole shall be continually on the increase; and this is really the pivotal point in all forestry. Any system that aims at anything less than this must be a failure. We have, from long-established habit, come to view the forest as only a temporary source of profit. We feel somehow that it will soon be worked out, and then give place to some other industry. This is all wrong. Forestry should not simply *preserve*, it should *increase*. There will be an alternation of forest products as of other farm crops. The pine of to-day may give place in the next generation to hard timber, or we may cut the oak, the beech, and maple, and our children may harvest the pine, spruce, and hemlock. The second crop will as surely come in requisition as the first. And the same will be true of the third and the fourth.

The forester's true field should embrace, in the first place, all steep hillsides and mountainous regions, unproductive barrens, and sand dunes; and second, one-fourth, or still better, one-third, of all naturally productive and tillable land. Let every man, who has a quarter-section of treeless land, begin now to put forty or fifty acres into forest. If the work is intelligently done, the average farm products of that quarter-section will be increased rather than diminished, while the growth of the forest will be like money at interest for years to come. For obvious reasons, the artificial forest will be far more remunerative, acre for acre, than the natural one; and herein will be found the greatly enhanced profit of tree culture upon tillable land. The natural forest should never be encroached upon beyond certain limits. Every precaution should be taken against forest fires. The pruning of the forest should only be intrusted to experienced hands.

The growth of the past has been a mere matter of chance; in the future, it should be one of culture.

To secure a perpetual revenue from the forest, we shall need —

1. To utilize all its products. Hitherto waste has been the rule. Single Black Walnut trees, in Illinois, which, if standing to-day, would be worth more than the original cost of the quarter-sections on which they grew, have been ruthlessly cut and split into rails and posts. The demands of civilization are so varied and multiplied, that there is scarcely a product of the forest that is not wanted in the market. The hard-wood timbers call into existence an almost endless variety of industries, and give employment to a vast number of workmen. Of the finer varieties of timber, there will never be a glut in the market. The forest crop on every farm should be utilized with as much care, and as regularly, as the crop of wheat or corn. The care of the forest should become a prominent part of every farmer's business, both for its immediate and prospective returns. The idea of waste in the timber should be as repugnant to the farmer as the waste of corn or hay in winter. The market demands upon the forest will change from year, but they will never cease. What is not wanted to-day, may in a very short time find an open market.

2. It must be held as a matter of national importance that the natural forests should not be encroached upon beyond certain established limits. This would involve a special treatment of the natural forests, and probably a Government oversight. It is nothing less than a national calamity to have our mountain-sides stripped of their timber, and, by repeated fires, to have the young growth and even

soil destroyed, until vast areas become a desert waste. This ruin will here, as in the Old World, reach down into the valleys and desolate pleasant homes. It becomes, then, a question of law. A forest commission or superintendency, with a code of laws suited to our needs, should be among the first demands of our people.

3. Much can be done by encouraging artificial forestry. This thought applies especially to the great treeless plains, and to vast tracts along our sea coast. To this end, special legislation should encourage forestry by all practicable methods. In the States naturally deficient in forests this encouragement can be probably given most effectively by the general dissemination of reliable instruction in regard to the best methods of forest culture. No wise legislator will be guided by a narrow-minded policy in this matter. It will be essential to regard it both as a State and national interest that cannot be safely left to individual effort. The State horticultural societies that have given attention to forestry should be liberally aided in their work. The effort from the beginning should look forward to a systematic treatment of the whole subject. But it will not do to await action until this can be done. Little by little will that system be built up. By slow but sure steps we may verge toward the time when forestry shall be made a specialty, and be counted among the legitimate and remunerative industries of life. In the meantime, we ought to scatter broadcast such knowledge as is attainable upon forestry in all its bearing. That will involve all questions relating to the profits and uses of all forest products—all questions relating to atmospheric or climatic influences—modes and uses of protections, and the abuses of the same—influence of forests on growing crops and animal life—the relation of forest and fruit culture—the varieties of trees most desirable to plant in any given region, besides the more elementary and practical questions as to how to handle the various kinds of trees, their seeds and cuttings. And, looking to the same end, a yearly interchange of experience among those interested in the culture will in the future, as in the past, prove a great aid in promoting the interests of forestry.

THE IMPORTANCE OF FOREST-TREE CULTURE TO THE NORTHWEST.

BY M. MOHLEB, DOWNS.

What and where is the Northwest?

For the purposes of this paper, I will say that the Northwest comprises the two northern tiers of counties in Kansas, commencing with Mitchell and Jewell counties on the east, and extending through to the Colorado line on the west—a belt of territory sixty miles in width and over two hundred miles in length. This has also been called the great homestead region of Kansas, as nearly all of this large belt of territory was subject to homestead entry.

Now, before entering upon the discussion of the topic assigned me, I will call attention to this fact: that our section of Kansas, unlike southwest and central Kansas, has been settled and built up unaided by railroads. While this was an advantage in some respects, it was in other respects a disadvantage. It gave us a large population in a comparatively short time, but we lacked capital. Capital is inclined to follow railroads. This gave southwest and central Kansas the start. But of late years, since we have the railroad, capital has been moving in this direction at a brisk rate, and the progress of the Northwest has been surprising.

The natural order of development of the horticultural resources in a prairie country, and especially in western Kansas, is from the most easily-grown forest trees to the more difficult, and from that to fruit culture. This order was reversed in this section of Kansas. The settler commenced with fruit trees. He came to this country full of enthusiasm, and with lofty expectations. He could see no reason why he could not in a few years be surrounded with all the comforts and luxuries of an old-settled country, and everybody at once went to setting out fruit trees of every kind. Our friends in eastern Kansas shook their heads—"risky," they said—but we said, within ourselves, we will show you. As all this country was to be supplied with nursery stock, and as home-grown is preferred in all countries, immediately half a dozen nurseries sprang up in Osborne county. I started in the business in the spring of 1872. Out of 12,000 apple grafts set out that spring, and 15,000 more the spring following, not a dozen trees remain, and these are dragging along a wearisome life.

Out of 4,000 grape-vines growing on my farm in the spring of 1874, and much other small fruit, not one remains to tell the story of its grief. Thousands of dollars were sunk in the nursery business, and thousands more were invested in foreign-grown stock, and lost by the homesteaders in their eagerness to grow fruit at once. Thus defeated and utterly routed at every point on the line, and no reinforcements at hand, we were obliged to surrender, and nearly all became discouraged.

In the fall of 1875, Mr. Joseph Savage, of Lawrence, was invited to attend a county fair in Osborne, and, in an address delivered on that occasion, he said it was as yet an unsolved problem whether we could ever raise apples or any other kind of fruit at this high altitude, and that we could solve that problem only by continued experiment. He suggested the propriety of growing forest trees first, as a means of protection to fruit trees. The people then commenced growing forest trees, chiefly for wind-breaks, and in every instance those who have apple orchards in good condition and coming into bearing, are those who planted timber belts at least on three sides of the orchard.

Our fourteen years' experience, therefore, in fruit culture in this section, has taught us this important fact, which, I presume, is also applicable to all other new sections of Kansas, that the first step towards successful fruit culture is the planting of forest trees; and the more extended the planting the better, provided, only, that you do not by close planting prevent the free circulation of air, nor exclude the sunlight from them.

Here, then, is one instance which demonstrates the importance of forest-tree culture to the northwest. But to say that the value of forest-tree culture is wholly or chiefly in its use as a wind-break, is, I think, far from the truth. It has a higher and broader value in its influence in bringing about that climatic change which is acknowledged to be of the highest importance, not only to fruit culture, but to the growing of all kinds of crops.

That the climate of every portion of Kansas has undergone such a change as the settlement and improvement of the country progressed, is clearly a matter of history. The only question in regard to which there can be any difference of opinion is, as to the relative potency of the various means or agencies which it is conceded are instrumental in effecting the change. Unquestionably the opening up of the pores of the earth by cleaving the soil, thus admitting into its bosom the rains as they fall from heaven, is a most important agency; but the growing of forest trees beyond a doubt tends to produce the same result, the potency of this agency increasing, of course, as the forest area is extended. Trees absorb a vast amount of heat and moisture, and, diffusing them gradually, are powerful agents in moderating the extremes of heat and cold, and these extremes of heat and cold are especially damaging

to orchards as well as to crops in general. Forests, by reason of their capacity to hold moisture as it comes from the clouds, and returning it gradually to the atmosphere, are most effective means, not so much to increase the rainfall as to secure a better distribution of it. And this we all know is a most important thing to us in growing crops.

Two years ago the *New York Tribune* was full of earnest words to the State Legislature in behalf of the forests of that State. It claimed that the disastrous effects of the destruction of the forests on the Adirondack mountains was already experienced in various ways; that the vegetable matter formed by the decomposition of the immense forest foliage had formerly served to hold in check the water as it fell from the clouds, and then gradually gave it off to the streams below. But since the removal of the forests it had gradually been washed away, and the water as it fell, being unchecked, rushed in torrents down the mountain-side into the channels below, and terrible, disastrous floods which were never known in the earlier history of the country, followed. And the *Tribune* held the theory that the climate was becoming drier and more liable to drouth, and successful agriculture as a consequence was more hazardous. The idea, however, is not a new thing in the world's history. I remember years ago, while studying Warren's *Physical Geography*, of coming across this important historic fact, that Egypt, centuries ago, allowed the wholesale destruction of her forests, and that in consequence the climate underwent a change, the rainfall grew less and more irregular, and the agricultural interests of the country suffered; and that the Sultan, recognizing the destruction of the forests as the cause, ordered the restoration of the forests by planting trees at the expense of the government, and the subsequent history of the country demonstrated the wisdom of the act.

It may be laid down, therefore, as one of the established facts of history, that the destruction of forests tends to disturb that equilibrium of atmospheric conditions which is essential to the best results in agriculture, and that it is therefore detrimental to the happiness of mankind. If, then, the destruction of forests tends to destroy those atmospheric conditions essential to the best results in agriculture, the growing of forests must tend to restore them. Instead, therefore, of building large ponds as reservoirs on the Western plains by which to destroy that aridity in the atmosphere which repels rain, in regard to which there has been so much said, let us do the more sensible thing of growing forests, if need be at governmental expense, and in this way provide reservoirs in nature's ways, which are cheaper and will serve the people better and remain a blessing to the country forevermore. The importance of forest-tree culture on these Western plains, in this broader sense, can scarcely be overestimated.

Again, forest-tree culture for ornamental and protectional purposes is also worthy of consideration. A home without a tree or a shrub about it is like a channel without water in it. It lacks the first element of a beautiful home, such as our children would be loth to leave and would delight to remember in after years as the most lovely spot on earth. There is absolutely nothing in all this world of a material kind which throws such an attractive charm around a home as a judicious admixture of ornamental trees, such as shrubs, evergreens and other varieties of an ornamental character. A tree is a thing of beauty and a joy forevermore. There it stands, mute, silent as the eternal hills, and yet with its myriad tongues speaks of beauty, grace, loveliness—qualities which cannot fail to enter into the substratum of human character as the boys and girls luxuriate in its friendly shade.

Here I would like to put in a voice for Osage Orange hedge fence. In a country like this, where every tree that grows imparts a beneficent influence, we ought by all means to encourage the growing of Osage Orange hedge fence. When coming

down from Osborne City to my farm in the dry, hot summer of 1880, I shall never forget the impression my hedge fence made on my mind. While everything else in nature had put on a deadened, seared aspect, this Osage Orange was as bright, fresh and beautiful as though it had but recently enjoyed a bath from a summer's shower. That fresh, green border around my farm, when everything else was dried up, was a thing of beauty.

Aside from the value of trees to our country as a modifying agent of climate and as an agent for ornamental purposes, they have another great mission in this world, and that is to bring comfort to both man and beast. The proper distribution of trees, either in timber belts or in groves, about the building, as well as on different parts of the farm, has a protectional value which we cannot well estimate. They protect us measurably against the cold and stormy blasts of winter and the oppressive heat of summer, and while this protection and comfort which trees are capable of furnishing is desirable for man, it is necessary for the animal. Man can take refuge in his cellar on a withering hot day, or seek some other shady retreat at his will, but our domestic animals must stand in the open field and take it, with nothing to afford relief. Have you ever thought of this? How little we do for the comfort of those animals which are of so much value to us. It is an outrage against the brute creation which the common instincts of humanity everywhere condemn. Stock need trees for protection in winter as well as shade in summer. Of course they should have shedding for shelter in the winter, but with shedding, trees are a wonderful help in breaking the violence of storms before they reach the shedding. A ferocious blizzard coming at the rate of seventy-five miles in an hour is torn into fragments in passing through the outer works of defense built of closely-planted trees, and passes over the inner ground before its fiendish ferocity is recovered.

Now right here is a thought I wish to impress—that in the planting of trees for the different purposes for which trees are desired, only good common sense is needed. When grown for ornamental purposes, they should be set a proper distance apart, with a judicious admixture of varieties of trees, such as to meet the requirements of good taste. When grown for comfort, and protection against heat in the summer, the trees must be set a sufficient distance apart to admit of a free circulation of air, and such varieties of trees should be grown as will make a dense shade. These requisites of comfort are frequently wanting in our Western homes. We frequently see homes surrounded by a dense forest, which not only obstructs the vision, but prevents a free, healthy flow of atmosphere. This is not only decidedly uncomfortable to the inmates in the heat of summer, but is, I think, unhealthful. When, however, we plant trees for winter protection, we want them close together—the closer the better, provided that they have room to develop into good proportions. A good, well-grown hedge fence (Osage Orange), supplemented on the north by a half-dozen rows of any good, healthy-growing forest trees, from four to six feet apart, makes an excellent protection. Red Cedar is still better than Osage Orange, and is almost as easily grown, but slower in growth. Six years ago last spring I bought 500 Red Cedars—seedlings—costing \$1 per hundred. They were set on the inside of a paling fence running north and south and east and west, about eight inches apart. I did not lose over one per cent. Four years ago I took up every other tree, and now the balance, although they were never trimmed, make a close fence, and are between six and eight feet high. These are especially valuable for winter protection, because their foliage remains during the winter. They have the advantage also of being ornamental as well as useful.

Now, having considered the importance of forest-tree culture as a means of

modifying the climate, as a means of beautifying homes, and as a means of protection during summer and winter, we come to consider the question of profit. Should we encourage our people to plant forest trees with the idea of profit from the timber grown? Were I to answer this question with an unqualified yes or no, I would say no; because the same reasons which induce us to plant trees will induce us to let them stand forever. I cannot imagine a time when we will not need trees for shade in the summer, for shelter in winter, for beautifying the landscape, modifying extremes of heat and cold, etc. Indeed, no prairie country is complete without trees sufficient for all the purposes for which trees are now planted.

There is, however, this to be said on the other side: When groves are planted of considerable size, the trees should be planted close together, four feet each way or four feet one way and six or eight feet the other. Four feet each way I prefer. When small they protect each other and grow up straighter and make nicer trees; especially is this the case with Walnut, Honey Locust and other varieties which are inclined to spread themselves. It costs no more each year to grow an acre of trees than it does an acre of corn, and when the trees are planted four feet apart each way, the same kind of cultivation as given to corn will answer every purpose for trees. My opinion is that planted in this way the trees will be cultivated and cared for better than when planted at a greater distance apart.

As the trees grow and need more room, they can, and ought to be, thinned out. Those which are cut out are worth something for fencing, shedding, etc., and when they have grown larger, some varieties may be valuable for posts. If the Catalpa is as valuable for posts as it is claimed to be, there would no doubt be some money in them, and yet leave a sufficient number standing to make a good grove of fully developed trees. (The Catalpa is fast growing into popular favor.) It is safe to say, I think, that in this way a grove, whether large or small, may yield a revenue sufficient to pay good interest on the capital invested in the land planted to trees up to the time the grove is completed; and then with trees from twelve to sixteen feet apart each way, the grove may be sown to tame grasses—orchard grass, for instance—and be as valuable, more valuable, for pasture, than any other part of the farm. I venture the assertion that not one man in a hundred who has a grove of ten or twenty acres of that kind with a good stand of orchard grass on it, would take three times the value of the land and have the grove removed.

Viewed from every possible standpoint, therefore, forest-tree culture, not only in the northwest, but in every part of Kansas, is profitable, and should be encouraged in every way possible.

I consider the following the best varieties for the northwest: Honey Locust, Black Walnut, Catalpa, Cottonwood, Osage Orange, Ash, Ash-leaved Maple (Box Elder). These are all successfully grown here. The Cottonwood is not reliable for the uplands, but for the bottoms, draws, and wherever it can reach plenty of moisture, it is an excellent grower. Honey Locust and Black Walnut are safe trees to grow anywhere in this section, and are valuable when grown. The former is a rapid and beautiful grower. The Walnut is a slow grower in the start, but after a few years grows finely. It is a first-class tree for this country, enduring more downright neglect than any other I know of; it never dies. The Catalpa, as I have said, is fast growing into popular favor. It is hardy, a good grower when well cared for, but will not endure neglect like the Walnut and some other varieties.

Now, in conclusion, I will say that here in the northwest more attention is given to growing trees than formerly. We have found that they can be grown successfully in this part of the State. We have learned to appreciate their value, and have become able to give more attention to their culture than formerly.

THE OSAGE ORANGE AS A TIMBER TREE—ITS CULTURE AND ADAPTATION TO KANSAS PRAIRIES.

BY THEO. BOGGS, M^RPHERRSON.

Not long since, a gentleman while passing through one of the parks in our city, remarked to me that he did not notice trees now, as he did before moving from Kansas to a timbered part of Texas. Who like a *Kansan* admires trees, whether in his own State or elsewhere? He not only sees beauty in the form, but admires the variety. During the early settlement of this State, or more particularly of central and western Kansas, it was considered a matter of minor importance what was planted, so that it was a tree, or something that would probably grow into a tree, and whatever was obtained at the least cost and trouble was usually chosen. May I not say that *unfortunately* for the State of Kansas the Cottonwood and the sunflower grow spontaneously, and both are a curse to the tiller of the soil. What a blessing were the Cottonwood valuable in proportion as it is easily grown. Not only is the wood almost worthless, but the tree is short-lived, for on the upland prairies where planted in groves, comparatively few trees live to be over fifteen years old. The questions with the tree-growers of Kansas are:

First, What shall we plant that will stay with us, and benefit humanity after we are gone?

Second, What shall we plant that will mature rapidly and be of use while growing?

Third, What will be remunerative in after years, and not be destroyed after grown or partially grown, by summer heat or drouth, or by severe winters, or by ravages of insects?

In responses to these, and other questions of like import bearing on this subject, men of experience differ, and, while I don't expect to meet with the approbation of all who may hear what I shall have to say concerning the Osage Orange, I believe I can offer some arguments in its favor as a forest tree, as being well adapted to the latitude and climate of Kansas. I am aware of the fact that there is quite a prejudice against the Osage Orange as a tree, and I think all such may be classed as an ignorant prejudice. For example, I heard a Missourian, whom I hired to trim some trees of this variety, say "he wouldn't let a 'Bodock' tree grow on a place of his, for he had seen the thorns so thick on the ground around the trees in Missouri that a man couldn't get within six rods of the trees." The mere fact of its being so well supplied with thorns as a protection while young is no reason why it should be condemned as worthless. Give the tree a chance, and in a very few years the thorns will be up and out of reach and harm no one, and I think that, with perhaps two or three exceptions, we have no variety of trees that will equal the Osage Orange in rapidity of growth, and, without exception, nothing better adapted in its nature to a dry climate. Professor Budd, of Iowa, in some remarks before the Forestry Congress at Denver, stated that trees and plants with thick leaves would stand the drouth much better than those with thin leaves. In proof of this, I have but to cite you to the cactus family, the plant generally known as "live-for-ever," and many others of the same nature belonging to the plant family.

With trees, I will head the list with the Osage Orange, which has a thick, solid leaf, well suited for gathering nutriment from the air for the sustenance of the branches and trunk. No tree may be so much abused, as the Osage Orange often is, and still, despite the circumstances, live and do well. Every farmer who has had any experience with Osage Orange hedge plants, knows that in the spring he usually defers planting these till his spring crops are all in, and perhaps his corn is plowed

over at least once, for he knows it will grow anyhow, even though planted very late in the season. I have known hedge-fence contractors to haul the plants around over the country in their wagons, when the weather was quite warm, too, for a week or more without applying any moisture whatever to the roots to keep them alive, and yet these same plants, being properly planted and cared for, soon started to grow and made good hedges. No doubt they would have done better had they been properly cared for in the start. But how would the Elm, Ash, Locust, Black Cherry or any other variety stand such treatment?

It has been asserted that the Osage Orange is nothing more than a shrub, and only fit on account of its dwarf nature for hedges. Men who have known the tree in its native State (Texas) state that it is found in large quantities along the river bottoms, where it attains a height of 80 to 100 feet, and in size from $2\frac{1}{2}$ to 3 feet in diameter. That it is also used extensively as an ornamental shade tree in that State. It is also a fact that the wood is being used all over the United States in the manufacture of various kinds of furniture, and of buggies and wagons, and that the wood, being very hard, will admit of a very fine polish, equal to that of Walnut or Mahogany. In Texas it is used extensively for railroad ties, posts, grape-vine stakes, fork handles, whiffletrees, and many other purposes requiring hard wood. It is said that no wood will last longer in the earth than that of the Osage Orange. It has been known to be sound and solid after being in the ground fifty and sixty years, and in other instances perhaps longer.

There is no question, or need be none, as to the hardiness of this tree. What tree that grows would stand the treatment this does in the hedge-row? Cut it back two or three times a year, and you cannot kill it. Some assert that the more you "hack it the better it grows" and the better fence it makes, but this is not true. There is a great deal to be learned about it even as a hedge-plant. Treat any other tree as you have treated the Osage Orange, and it will very soon die, but give the Osage Orange the same treatment you do other trees, and you will have as a result a beautiful and valuable tree.

Nothing is better adapted to the high and at times dry prairies of Kansas. It very seldom dies after it once starts to grow, provided it has any sort of care and protection. Its nature is to send out a great many fibrous roots, which gather moisture and sustenance for the tree. For the first few years the root grows faster than the body, and as a result the trunk will send out a number of sprouts or side branches, which should be trimmed off every year, leaving only the one central or main stalk for the trunk of the tree, which will grow very rapidly and soon absorb the substance gathered by the roots and no longer throw out laterals along the trunk, but the strength and growth will manifest itself in the top, which from this time onward tends upward, and in a very few years the result is a handsome, valuable tree. When planted in groves at proper distances apart, and properly cared for, the trees will grow very rapidly. Why Commissioner Sparks ruled against the Osage Orange as unfit for a forest tree under the timber-culture act, I am unable to state. His theory might apply in some of the extreme Northern States, but it should not be made universal. From personal experience with this tree I know that it will do well anywhere in the United States south of the 40th parallel of latitude, which is in line with the north line of this State, and I am persuaded that it will grow and live considerably north of that line. My experience also has led me to conclude that with proper care and cultivation a growth of 3 to 4 inches from the heart may be obtained in a period of 8 to 10 years, making trees 6 to 8 inches in diameter. One writer from Texas states that in a period of 15 years it will make an average growth of an inch a year in diameter.

The Osage Orange seldom sprouts from the root, and then only when the root is

cut or injured by plowing or otherwise, and this is seldom done, for the roots usually run deep, and ordinary plowing does not reach them.

The Osage Orange is hardly ever troubled by insects of any kind, and never by borers, and everybody knows what a curse the borer is to the Locust and many other trees. It is believed by some that a branch of the Osage Orange bent down and covered up in the earth will take root and grow, which is a mistake. It must be propagated from the seed, and this is very easily done, though I would advise purchasing good one-year-old plants from nurserymen, and thus save a year's time.

For a grove, the plants should be put about four feet apart, and cultivated during the first two or three years with about the same care as corn is usually given. The trees should be side-trimmed once a year, and, although it is more labor, I would advise pruning after the wood has matured, for when a tree is summer-pruned, the tendency is to dwarf it, and in a measure impede its growth. Trees may need side-trimming-during the first four or five years, in order to give the desired shape to their trunks, and allow room for passing between the rows for cultivating. While I would not consider it the best way to get a valuable grove of Osage Orange, yet by planting it in rows four feet each way, and cultivating for two or three years, and then let it go without trimming or any further cultivation, it will succeed under such treatment far better than the Cottonwood, Black Walnut, or any other variety of trees handled in that manner. After two or three years' cultivation, the tops will afford sufficient shade to keep the weeds down and allow the trees to grow. But then this tree is of sufficient value to justify care and attention, and I am fully satisfied that after our Kansas tree-growers get to know what value there is in it, and how much more easily it may be grown than many other varieties much less valuable, they will not fail to plant the Osage Orange.

FORESTRY OBSERVATIONS.

BY W. J. COLVIN, LARNED, PAWNEE COUNTY.

I find the best growth of all classes of forest trees in groves planted on sandy land, and especially where water is near the surface of the ground; that the best results are found where the preparation of the land before planting has been deep and the land thoroughly pulverized, and where the trees have received constant and thorough culture. The cause of most failures can be traced to a neglect of these requirements.

Plowing in September exerts a greater benefit to the trees than when done at any other season of the year, if well cultivated during the fore part of the summer. All plantations have made a better growth during the past two years than in the four years previous.

Settlers are convinced that forest trees may be profitably grown, and are giving more and better care to their plantations. It is now evident that with the shelter of forest-tree wind-breaks, fruit can be grown abundantly. These should be constructed on the north and south sides of lands devoted to fruit culture, to be useful.

There are thousands of small groves of Cottonwood in Pawnee, Edwards, Stafford, Pratt, Barton, and as far west as Ness and Hodgeman counties, which measure twenty to forty feet in height, and a great many Black Walnut trees, which are now bearing nuts.

Because the Cottonwood is the cheapest and easiest to obtain, it has been most extensively grown. But it is the least valuable of any tree we have, and a heavy robber of the elements of our soil. There are several varieties which, though not such rank growers, are more valuable, as the Honey Locust, Black Locust, Black Walnut, Mulberry, Catalpa, and Ash-leaved Maple, and are equally as hardy when well cultivated.

In Stafford county, I noticed splendid groves intermingled with fruit, both large and small. Would recommend the plan of mixing trees of different kinds in planting, and all young trees should be trimmed up during the first and second years, and the following spring cut down to the ground, to induce a strong and vigorously growing sprout to form for a trunk to the future tree. All trees thrive best when planted in a deep furrow similar to listing for corn.

Walnuts do best when planted in the fall, and covered with a uniform depth of soil. The young plants generally get a start before weeds, and can be cultivated early in the season.

I do not believe in the theory that trees increase the rainfall, but they change the condition of the soil and atmosphere materially. Cultivation retains moisture in the land, and the vegetable matter turned under enriching it renders it better capable of supporting tree growth.

In planting a grove the hardiest kinds of trees should compose the outside rows, and form a protection for those less hardy on the inside.

Measurement of growth: I measured a current year's growth of a Black Walnut sprout, and found it five feet in length, and many others from two to four feet. These are on the farm of Mr. Vanderbeck. The growth of his Catalpas and Honey Locust is nearly as good. Mr. M. M. Miller, East Pleasant Valley, Pawnee county, has a grove of six acres of Cottonwood cuttings, set last spring in rows four feet apart, which had on 1st of September made a growth of three to ten feet in height, with very few failures. In another block of ten acres of mixed varieties the growth was very strong; wherever the cottonwood occurred in this block an injury was noticed to the adjoining trees of other varieties. I am satisfied from the extent of forest-tree planting, and the character of growth made each year, that in ten years Pawnee will be classed as a timber county.

HISTORY OF FORESTRY EFFORTS IN STAFFORD COUNTY.

BY C. G. M'NEIL, STAFFORD.

The early efforts to grow forest trees in Stafford county have resulted in showing ten failures to one of success. The principal cause has been from a want of proper knowledge with the planter as to what, how and where to plant, and the necessary preparation of the land. Yet with so many failures, there are to-day many beautiful groves of from one to twenty acres, which adorn and beautify the homes of the settlers and the prairie landscapes, and are exerting a benign influence upon all things pertaining to settlement and development of the southwest.

Their beneficent influence cannot fail to inspire and excite noble sentiment in the mind of him who plants and cares for them, until he comes to regard them as objects of love, which elevate his moral being, and turn his thoughts to the Creator of all that is good.

The work of planting and of culture is a constant study. It leads to thought, and thought leads to action. No intelligent planter pursues his work without some purpose guiding him. He sets a tree to grow it, and to do so successfully, must study the requirements. This excites action of the mind; his reasoning faculties are brought into play, and as time passes on he is gradually being trained into a knowledge of the laws that govern plant life. True, he may fail at times in his comprehension. Who does not, in every vocation of life? But these, Nature, true to herself, corrects through those failures, and the lesson taught is, not to follow again in such lines. Some of these mistaken lines are as follows: A disregard of proper time for the preparation of the land before planted, and the extent of such preparation. All experience shows that success depends upon a thorough breaking-up of the natural sod, and the complete subduing of its wild character by at least one year's thorough tillage before trees, seeds or cuttings are set thereon, and the more thoroughly done the greater will be the success. Shiftlessness in this line brings its sure reward in partial or total failure.

The larger portion of the early planters in this region had no experience in this line, and had to feel their way according to their best judgment, considering climate and character of soil. But those having a teachable mind soon took in the requirements, and became successful. The use of large-grown trees and shipped-in stocks has been abandoned, seeds and cuttings having proven much safer. The Ash-leaved Maple, Ash, Elms, Osage Orange and Catalpa are most successful when their seed are planted where they are to be grown into a future tree, as transplanting causes more or less check to their vigor and wood-growth. All cuttings must be planted in good, deep and well-prepared land, and, when practicable, sandy land should be selected. Thorough and oft cultivation is necessary to secure best results. In fact, such culture as is needed to produce a good crop of corn is the surest in the management of forest plantations.

The efforts of more recent planters, who have the advantage of early experience, are very promising. With the intelligent, few discouragements occur.

THE RUSSIAN MULBERRY.

BY I. HORNER, EMPORIA.

This variety of the Mulberry family is unequaled by any of the deciduous species yet tried in Kansas, in its capacity to endure the drouth liable to occur on the so-called "arid plains." Of the several millions planted in central Kansas by the Menonites in 1876, and since, very few, if any, have perished from any cause. It has often been called "only a bush" or "shrub." This false idea, however, has been dispelled by more recent observation of some of the sports, which clearly show a rapid and vigorous growth, with all the natural traits of a timber tree. The writer had an opportunity to measure a tree growing in Marion county, during May, 1886, which gave the following dimensions: Circumference two feet from the ground, 37½ inches; height, 30 feet; and diameter of top, 28 feet; age, 10 years from seed. This tree bore excellent fruit—equal to the best Lawton blackberry in size and flavor—from the middle of May to the middle of October. Many other trees of nearly equal dimensions are found in other places. Its endurance of drouth is fully equaled in its endurance of extreme cold, having sustained the climate without injury as far north

as latitude 47, and slight injury in latitude 49, and which was in most instances traced satisfactorily to late cultivation.

Throughout western Nebraska and Kansas it passed the trying winter of 1885 and 1886 without injury, excepting in late-cultivated yearling plants. There is a vast difference in character of growth and quality of fruit. Most trees sold by nursery-men have been grown from seed gathered from mulberry hedges and trees, with no regard to quality of tree, and which naturally generates a large per cent. of inferior stock. These may be known by a disposition to branch freely close to the ground, and a drooping inclination of their growth. They bear small, notched leaves, and very small, insipid fruit. Seed gathered from sports of rapid, upright growth, carrying large, oblong leaves, will produce a much better quality of fruit, and rapid growth.

The best season for planting the seed is in autumn. It will make quite satisfactory growth when planted in the spring.

New ground is preferable to old. Plow it deep and thoroughly pulverize the surface. Drill the seed in rows four feet apart, and cover about half an inch deep. If planted in fall, cover the drills with inverted sod, or other heavy material, which remove in spring as soon as the seed sprouts.

My experience in western Kansas convinces me that buffalo-grass sod plowed under to a good depth, seven or eight inches, is preferable to old ground, as it retains moisture better, and is free from weeds. In the spring of 1886, which was very dry, I planted near Dodge City, Ford county, about seven thousand Russian Mulberry trees, on the 20th day of May. Two days prior to planting, a severe hail storm seriously injured the trees, and still about 90 per cent. survived and made good growth. This was a test case. The land used for this plantation was prepared as follows: The sod was broken and land subsoiled on the 18th day of May, and then planted as above stated.

This tree is valuable for the construction of shelter belts around orchards, and for other protections, screens, and for shade. Shelter belts should be constructed in rows twelve to sixteen feet apart, and the trees from two to four feet in the row. When three years old, cut all level with the ground. From their roots will spring up strong and rapid growth of sprouts. Remove all but the strongest to each tree. After two years thin out as may be desired, and a large number of excellent fence posts may be taken from those trees cut out in the thinning. One of the most essential points to be observed in the management of this tree is a thorough surface tillage of the land on which they are planted.

A DESCRIPTION OF THE WHITE AND GREEN ASH.

BY J. W. ROBSON, CHEEVER.

[As there is a confusion among tree planters regarding these two varieties of the Ash family, and a great difference in their value for timber purposes, it is deemed important to make the description as clear as possible, to enable forest-tree planters to plant judiciously and understandingly. Therefore the following paper has been kindly furnished for publication in this book by Professor John W. Robson, Cheever, Dickinson county.—SECRETARY.]

WHITE ASH (*Fraxinus Americana*).

Leaves 1 foot long; leaflets 7 to 9 inches; lance-shaped; edges obscurely serrated upper surface shining green; under surface covered with a whitish bloom. Seeds oblong, obtuse; seed portion half as long as the wing. The heart wood is nearly a

scarlet color. I have found trees of this variety in the Mississippi river bottom which would measure four feet in diameter and eighty feet in height.

GREEN ASH (*Fraxinus viridis*).

Leaves 10 inches long; leaflets lance-shaped, sharply serrated, with a bluish bloom on both sides of the leaf; the axils or veins slightly downy. Seed: the seed portion is as long as the wing. Tree attains to the height of 25 feet in favorable locations. I cut a tree of this variety on Chapman's creek (Dickinson county) that measured 18 inches in diameter and 28 feet in height. The trees of these two varieties resemble each other so much when young that the casual observer would not detect the difference. The white American is the more valuable to plant for commercial purposes. The green was called in my student days *Fraxinus juglandifolia*, from the strong resemblance of its foliage to that of the Walnut.

FORESTRY IN RAWLINS COUNTY.

BY W. A. MIKESSELL, ATWOOD.

Successful forest-tree planting in this portion of the State will depend upon a strict adherence to the following requirements: First, the land to be used for such purpose must be deeply plowed and pulverized during the year previous to planting. With a small shovel-plow lay off the lands in rows three and one-half feet apart. If cuttings are to be used, they should be made in autumn before hard freezing weather occurs, and kept in some damp place where they will neither dry out nor freeze during winter, and planted in spring-time when the ground and weather would be suitable to plant corn. Nut-bearing varieties, as Walnuts, Hickory, and acorns, should be planted early in winter, or else bedded out, so as to get frozen to crack the shell. Care must be given to keeping them and the earth in which buried moist, even, if necessary, watering them at times during winter. Ash and all other soft-shell seed may be partly dried and planted late in autumn or early spring—not later than first of March—and covered lightly. The young plants from seed, when just above ground, are very tender, hence need attention by cultivation to keep all weed growth subdued. They should be worked each season until two years old. I find that drilling the seed in rows three and a half feet apart, quite thick, affords the best results, as they will the sooner shade the ground, smother out the weeds, and grow into straighter forms for a future valuable tree. They will, from time to time, gradually thin themselves, as the land is needed for such as are able to maintain a supremacy over their neighbors.

Black Walnut and Ash have proved to be the most hardy in the northwest. Cottonwood and Ash-leaved Maple (Box Elder) are the most thrifty growers. Locusts are very vigorous and hardy, and will become leading timber varieties in this country. Russian Mulberry is a hardy and vigorous tree. Catalpa (Western hardy) is very liable to kill to the ground during extremely cold winters the first year from seed.

Any sort of forest trees successful in the eastern portion of the State will grow in this section if properly treated.

More care is required for a young timber plantation than in growing a crop of corn, and when this is bestowed there will be a rich reward in after years.

Evergreens have not been planted to any extent. I have a few growing from seed gathered in Colorado, which are growing finely, and are very promising for the future.

FORESTRY NOTES.

BY J. J. MEASER, HUTCHINSON.

Forest-tree measurements at the experimental station of the Atchison, Topeka & Santa Fé Railroad, at Hutchinson, Reno county; it being the earliest and therefore oldest plantation in the Arkansas valley, west of Newton, dating back to the spring of 1873:

AVERAGE MEASUREMENTS, FALL OF 1886.

Honey Locust,* circum. 3 feet 5 in., height 36 feet.	Black Walnut, circum. 1 foot 3 in., height 22 feet
Ash-leaved Maple, " 2 " " " 34 "	White Ash, " 1 " 1 " " 20 "
Catalpa, " 2 " 8 in., " 36 "	Kentucky Coffee Tree, circum. 9 " " 10 "
White Maple, " 2 " 4 " " 36 "	Black Locust, circum. 2 feet, " 22 "
Ailantus, " 1 " 8 " " 25 "	White Elm, " 1 foot 5 " " 22 "
Cottonwood, " 3 " 6 " " 50 "	

* This measurement is of the largest on the grounds. The average of the rows is about two feet 10 inches circumference.

NOTES REPORTED BY C. BISHIR, HUTCHINSON.

I have just measured the following kinds of trees grown on my farm at this point, and find:

Catalpa, 5 years 4 months old, from seed, measure 6 inches in diameter, 24 feet in height. These were originally planted thickly, in rows four feet apart, and thinned out on the second and fourth years, until the permanent stand is from eight to twelve feet apart; have been cultivated each year.

Honey Locust, of same age and given the same care, are about one inch less in diameter, and from five to six feet higher.

Catalpa, one-year-old seedlings, are preferred, and should be planted in rows four feet apart and two feet in the row. All branches kept trimmed off for the first three years, and thinned out each year, so that they will give a permanent stand of trees eight feet apart each way. When five years old the trunks will afford good fence or vineyard posts, and, if cut, a sprout will start up, which will in five years furnish material equal to the first cut. The durability of the wood, either in or out of the ground, renders this tree very valuable for purposes required on a farm.

NOTES, BY J. F. HIRSH, RELATING TO THE RAILWAY FORESTRY STATION AT GARFIELD, PAWNEE COUNTY.

The planting at this station has proved a success. The first attempt was made in 1874, and continued in 1875. Cottonwood, Ailantus, Ash-leaved Maple, Elm, Black Walnut, Black Locust and Honey Locust were selected for the experiment, which covered fifteen acres. The whole was inclosed with an Osage Orange hedge. From a close study of the results at the station, I consider the Honey Locust entitled to the first place on the list, and next to it, the Black Locust and Black Walnut for their valuable wood. They have made a good growth. The Ash-leaved Maple shows a fine growth, and formed a comely and attractive tree. At the time the grove was planted, the Ailantus and Cottonwood were considered the only varieties safe to plant. The others were regarded very doubtful. They have done well, and the Cottonwoods have grown into large trees, having a height of over forty feet, and proportionate diameters.

The grove has received no cultivation since 1879. This station, as well as others along the railway line, has demonstrated, beyond a doubt, that forest trees may be grown successfully, and, judging from the character of their growth, profitably.

ANNUAL GROWTH AND AVERAGE DIMENSIONS
OF SPECIES CULTIVATED IN GROVES AND TIMBER LOTS AT STERLING.

BY J. B. SCHLICHTER, STERLING.

The soil that produces the best results in wood growth is a sandy loam with a clay subsoil, where the water is within eight feet of the surface. Very sandy soil also produces good results, and heavy clay with an admixture of magnesia does fairly. In fact there is no soil in the vicinity of Sterling that does not produce good results in wood growth. We have here the condition that seems to be of prime importance to timber growth in this county, viz., *sub-irrigation*.

The plantations which I have examined to procure material for this report were made in 1878 and previous.

The first or earliest plantation was made in the spring of 1872. This was of one-year-old White Maple, planted on first breaking—a single row set in a dead-furrow. The average size of the survivors now is eighteen inches in circumference, and about eighteen feet in height. The condition of the soil is the most unfavorable, being underlaid by a bed of gravel and the surface about twelve feet from water.

A plantation of White Maples made in 1878 on more favorable ground has out-grown this, many of the trees measuring twenty-four inches in circumference and are about twenty-four feet high.

A plantation made on the Santa Fé depot grounds in 1873 gives the following, showing: Ash-leaved Maple, circumference 26 inches, height 18 feet; Ailantus, circumference 25, height 20; Catalpa (common), circumference 24, height 18; Cottonwood, circumference 42, height 36.

A plantation of Yellow Locusts, on my own place, from seed planted in 1873, gives the following results: Circumference, 24 inches; height, 36 feet. These have not been cultivated since 1875. In 1874 the grasshoppers not only devoured their leaves, entirely denuding them, but also ate the bark off the tender growth. They survived, and without cultivation have sent their tall, straight trunks upward, until some will make four good fence posts. No insects nor disease of any kind has ever affected them. Up to this time there has been no sign of the borer. Some of the volunteer sprouts are nearly as large as the parent.

Honey Locusts eight years from the seed, and transplanted, now measure 25 inches in circumference and 25 feet in height. Catalpa Speciosa six years from seed, are 21 inches in circumference and 20 feet high. Russian Mulberry, the same age, are 24 inches in circumference and 20 feet high. Black Walnuts planted in 1875 average 15 inches in circumference and 25 feet in height. The largest Walnut tree measures 24 inches at the base and is 30 feet high.

Cottonwood cuttings set in the spring of 1874 average 40 inches in circumference and forty feet in height. The largest Cottonwood tree measures 72 inches in circumference and 40 feet in height. This tree forks about 2½ feet above the crown. Both branches are 18 inches in diameter.

My largest Apple tree, a two-year-old planted in 1874, has a diameter of 8 inches one foot from the ground. The top, started two feet above ground, is a sphere, 20 feet in diameter. Peach trees planted the same time average about the same measurement.

A plantation of Russian Mulberries on Dr. Potter's place, planted 8 years ago, which were then very small one-year-old seedlings, now measure 36 inches in circum-

ference and are 18 feet high. These, being planted in single rows along the driveway, have formed low heads and broad, spreading tops.

A plantation of evergreens on the grounds of H. Conance,* planted eight years ago, deserve special notice. The trees were from 12 to 18 inches high when planted. The soil is sandy. Their measurements are as follows: Black Austrian Pine, circumference 24 inches, height, 16 feet; White Pine, circumference 15, height 12; Scotch Pine, circumference, 24, height 16; Red Cedar, circumference 12, height 12; Norway Spruce, circumference 12, height 12. (This Spruce tree was 4 feet high when planted.)

A Juniper tree three feet high when planted, is now 8 feet in height.

Red Cedars planted in 1881 are nine feet high. Some of the pines show a growth of 3 feet in one season. On the same plantation I noticed some White Birch, 8 years from the seed, measuring, circumference 16 inches, height 20 feet; a Russian Olive, last summer's growth $5\frac{1}{2}$ feet; and a Wisconsin Weeping Willow, 8 years from cutting, circumference 28 inches, spread of top 16 feet. Near by it stands an American Weeping Willow of the same age, but considerably larger, measuring a foot in diameter at the base. This one was considerably injured during the two winters past, while the other has stood the severity and seems to be as hardy as an oak. I also noticed some Yellow Willows 20 feet in height and 11 inches in diameter; two rows of Lombardy Poplar averaging 40 feet in height and a foot in diameter; Basswoods that have made a growth of 6 feet in three years, and Sycamores that have made a growth of 16 feet in the same time. Eight years ago the site of this nursery was a barren sand-burr patch, supposed to be too sandy to grow farm crops.

The Osage Orange as a forest tree: I have never seen it grown in a close-timber plantation. In hedges, if allowed to grow without cutting back, it will make fence posts from three to four inches in diameter in 12 years. The wood is very durable, and for this reason it would be a great convenience on the farm to have an acre or two planted closely. If planted in rows four feet apart and two feet in the row, they would grow straight, tall, and would make useful timber on the farm.

REMARKS.

1. The growths mentioned in this report are on the Arkansas bottom, where water in no case is over twelve feet from the surface, and in most cases it is only from 6 to 8 feet to the water.

2. These trees grown on upland or high, rolling prairie will average but two-thirds the size. The Cottonwood and Ash-leaved Maple, on high upland, may be regarded a comparative failure.

3. Where Cottonwood will grow forty feet high and thirteen inches in diameter in ten or twelve years, it is profitable to plant them for temporary groves and wind-breaks. A narrow timber belt of such trees on the south and west side of a quarter-section would prove invaluable. What an amount of firewood, poles for shedding, rails and posts for a barnyard fence this would furnish! A Cottonwood post cut in winter or early spring and set immediately will last from four to five years. Such will usually remain green and grow one or two seasons.

4. From the figures given in this report it will be seen that the farmer can raise his own fire-wood in ten years after breaking the sod. A ten-acre peach orchard, planted 10x10 feet, may not, in this part of the country, prove remunerative in its fruit product, but at eight or ten years old it will supply one of the greatest wants on a prairie farm, viz., fire-wood; while a mulberry plantation, 4x4 feet, of the same size and age, would not only furnish the farmer with fuel, but would supply many

*Mr. Conance has 10 acres in nursery, started in the spring of 1884.

other demands for a lifetime. If a young mulberry tree is cut in winter or spring, it will produce a second growth that will soon outgrow its parent.

5. The growths in evergreens are certainly encouraging. Mr. Amos Foot, near Chase, Rice county, has a plantation of Austrian and Scotch Pines on his grounds, on upland, which is equally as fine as those named in this report.

6. Facts are stubborn things, and figures tell no lies unless made to deceive. The statements made in this paper can be fully substantiated, and hence will furnish data upon which to calculate as to the profitableness of growing timber.

FORESTRY NOTES FOR 1886.

GATHERED AT POINTS IN THE STATE FROM OBSERVATIONS OF THE SECRETARY.

Desirous of determining by actual observations, for the benefit of tree-planters on the Western prairies, what varieties would best endure the arid conditions liable to occur in the western portion of the State, I took advantage of the drouthy period, and at a time when at its extreme severity, first visiting the Farlington forests at Farlington, Crawford county. These forests are mainly composed of Catalpa (Western hardy), ranging from five to eight years old. There are small bodies of the Ailantus, occupying the shaly ridges.

These immense blocks of Catalpa, having passed through a period of six weeks without rain, and two months with only a light rain, and an intensely hot sun for weeks at a time, I found in a good state of vigor, had made an excellent annual wood growth, with scarcely a seared leaf to be seen. They had not been cultivated for several years, having been abandoned to their own care. They were set in rows four feet apart each way, very few vacancies occurring. Their growth and foliage have formed a most complete shade to the land, and keep it clear of weed growth, cool, and even as moist as is needed for a healthy growing plant. The Ailantus trees were in an equally healthy condition.

I next visited the large forest plantation of W. E. Campbell, at New Kiowa, Barber county. Here also were large blocks of Catalpa, planted on the same system as that adopted at the Farlington forests. These trees are on their fourth year from seed. These were found in as healthy and vigorous condition as those at Farlington; and their heavy, dark-green foliage indicated no suffering from the severe drouth which had prevailed for weeks, and even partially for months. Being younger trees, and not sufficiently young to shade the land, as at the Farlington forests, they have not made quite as extended growth, but were apparently as healthy. By measurement I found the current year's central stem growth to range from two to four feet, and many sucker sprouts from the roots four to six feet in height, and proportionately stocky.

At intervals among one of the blocks I found Black Cherry, Ash-leaved Maple, White Maple, Ash and Cottonwood; and of evergreens, Black Austrian Pine, Scotch Pine, and some few Red Cedars. The outskirts of this block were protected with a closely-planted row of Russian Mulberry as a wind-break, and had been grown more in the form of a hedge. These were brushy, and evidently of a variety not desirable to plant for timber purposes. The Black Cherry was quite vigorous, and had made a good extent of annual growth. Its leaves were full, well formed, and large for the

kind, and indicated a healthy condition of the tree, which gave promise of becoming a desirable tree in forest-making. The Ash-leaved Maple had made a strong growth, but its leaves plainly showed that it was losing vitality, as also was the condition of the White Maple. The Cottonwood trees showed a better endurance than either of the last two named. I was much surprised to find the evergreens mentioned in good health in what had been characterized as arid plains, and especially because in the eastern portion of the State hundreds of long-established trees were daily dying under the drouth, and nearly all were gradually thinning in foliage.

At Wellington, Harper City, and Argonia, the Catalpas were in best condition of any varieties noticed. At McPherson, I examined quite a tract devoted to forest-tree growth. Here were planted the White Maple, Catalpa, Black Walnut, Ash-leaved Maple, and Black Locust, and, of special interest, a handsome block of Osage Orange, which had been planted as a test of the species for a timber tree. It was planted in 1882; had been well cultivated; their side branches trimmed off; their trunks were straight and well formed. They had attained to a height of 12 feet, and many to a diameter of three inches. The central stem growth was upright, and the current year's growth ranged from four to five feet. The judicious treatment given had developed them into every promise of a future useful and valuable tree. The most skeptical could but be convinced on this point. There can be no question of the future value of this grove for purposes in which durable and tough woods are needed. Another interesting grove in this plantation was the Black Walnut. The seed was planted quite thickly, in rows four feet apart, and the experiment made of transplanting from such places in the rows as they stood too thickly, to other and adjoining lands, was most highly successful, as only a very slight difference in the size could be seen below that of those not moved. All had made a satisfactory growth; many trees giving a diameter of four inches at the base of the stem. The Black Locust had proven a success, and escaped the attacks of the borer so common to it in many places. The Catalpas were healthy, and had made a strong and stocky growth, and with the exception of the Osage Orange had endured drouth of the season best.

At Garden City I found the Cottonwood thriving as a street tree, and as shade in the city lots, measuring in diameter from eight to ten inches, and from twenty to thirty feet in height, and as a shelter belt to residence and fruit grounds on some of the farms, nearly thirty to forty feet high. Here also was found the Catalpa, apparently as healthy and vigorous as in any part of the State. The growth was strong, and quite a number had made a current year's growth of from four to five feet. The Russian Mulberry was not promising of a good future tree. On one lot in the city, their slender-made growth required stakes to keep them in an erect position. From several years' experience with this species, and observations in different parts of the State, I am convinced that this peculiar shrub-like form belongs to a certain variety. It has a type of its own, and nothing more than a low, bushy form should be expected from it; and all efforts to make it grow into a tree form will fall short of accomplishing such a result. But I have found a variety in some places, and even have it growing upon my grounds, which affords every evidence of a future good-sized and well-formed tree, as has been repeatedly claimed by Mr. Horner, of Emporia, and is every way worthy of propagation and planting as a timber tree. But its propagation by seed cannot be depended on in reproduction of its form, until the parent tree is isolated from the influences of other types. It must, in my opinion, be propagated by cuttings, as in the propagation of our varieties of fruits, if we want its true form. These two types are found at Garden City in different lots.

Apple trees at Garden City made as strong and stocky growth as I have ever found in the eastern part of the State, and where such a growth of the apple can be

obtained, there need be no doubt of the success of such forest trees as succeed in any part of the State east of them.

At Lakin, 424 miles west of Kansas City, Cottonwood, Lombardy Poplar, White Maple, Balm of Gilead, Russian Mulberry, and the *Catalpa* and Red Cedar have been planted, and are successfully grown. The tendency to an upright growth is not so marked as at Garden City. But this is easily explained. Here they are planted singly, and on open and exposed places, not even given the advantage of self-shelter by being massed or grouped. The Russian Mulberry here planted is of the low, scrubby type, but is healthy. The *Catalpa* shows every promise of a rapid, vigorous growth if given shelter from the winds, or, as I am satisfied, if planted in numbers and in blocks sufficiently close to form their own shelter. From the year's observations, the evidence clearly points to the *Catalpa* (Western hardy), as the tree of natural stately habits, and best adapted to the western prairies. It possesses an endurance of drouth with least injury, equaled by none; is a stronger and more vigorous grower under such conditions than any, and if in age it keeps apace with its youth, it will afford the greatest amount of valuable material for purposes where wood is needed on a farm. The heart wood is very tough, and affords a fine finishing material, and for posts and fencing has no equal in its powers to resist decay, excepting the Osage Orange. It will not attain rapidly to height, only when grown closely in groves or mixed with known varieties having stately habits, as an inducing influence to an upright growth. The shade furnished to the land in a few years by this system is of the greatest importance to success. Its benefits in a retarded evaporation of moisture and the low temperature of the land secured by it, are essential to health and good growth; and its inducing influence to an upright growth is equally important, though secondary in its relations. These conditions are clearly evident to an observer of any successfully grown forest, whether natural or artificial, and while nature indicates them as a needed means, man must supply them in his attempts to grow artificial forests successfully.

There are other varieties of forest trees which are equally and may be more valuable for some purposes than the *Catalpa*, when grown, but their culture upon the western prairies is attended with greater risks, such as the Black Walnut, Honey Locust, Black Locust, Osage Orange, White Ash, and Black Cherry, and a certain type of the Russian Mulberry. But it should be borne in mind that none of these possess the power to resist the injury of continued drouth, and make a vigorous growth, equal to the *Catalpa*.

SOCIETY'S RECOMMENDED LIST OF FOREST TREES IN KANSAS.

This list is arranged in the order of preference for timber purposes:

- | | | |
|------------------------------------|----------------------|------------------------|
| 1. Black Walnut. | 5. Osage Orange. | 8. Honey Locust. |
| 2. <i>Catalpa</i> (Western hardy.) | 6. Cottonwood. | 9. White (Soft) Maple. |
| 3. White Ash. | 7. Ash-leaved Maple. | 10. Red Elm. |
| 4. White Elm. | | |

EVERGREENS.

- | | | |
|--------------------|-----------------|-------------------|
| 1. Red Cedar. | 3. Scotch Pine. | 5. Norway Spruce. |
| 2. Black Austrian. | 4. White Pine. | |

The list arranged in the order of the character of their wood:

Class 1—Soft Woods.—Cottonwood, White Maple, Ash-leaved Maple (Box Elder).

Class 2—Hard Woods.—White Elm, Red Elm, White Ash, Honey Locust, Catalpa.

Class 3—Very Hard Woods.—Black Walnut, Osage Orange.

Durability of their Wood.—The Catalpa and Osage Orange are the most durable when exposed either to the atmosphere or buried in the ground. The Ailantus, Black Walnut, Honey Locust, Mulberry, Ash and Elms are durable in dry places, and are desirable woods for inside finishing and in the manufacture of many kinds of implements which are housed in bad weather. Most of the other classes decay rapidly when exposed to rains and sun, and possess few valuable properties other than for a light fuel, temporary constructions, wind-breaks, and shade.

In their adaptability to locations and soils, all succeed best on lowlands. The Honey Locust, Catalpa, White Elm and Osage Orange thrive quite satisfactorily on uplands; they resist the injurious effects of drouth, and can be relied on when planted in such location.

The varieties most valuable for their wood are Black Walnut, Catalpa (Western Hardy), Osage Orange, and Ash.

Insect Attacks.—The Honey Locust, Catalpa, Osage Orange and Black Walnut are the least liable to, in fact are almost exempt from, any damaging species. The Walnut, within a few years and in some localities, has suffered in foliage from attacks of a species of the handmaid moth and fall web-worm; but as they live in families during their early stages, and form about them web coverings, can be readily discovered and easily destroyed. Most of the soft-wood class, and the Ash and the Elms of the hard-wood class, are liable to damage some seasons from the attacks of the flat-headed borer and certain leaf-eating worms. The attacks of this borer generally occur during the year of transplanting, and from a low vitality in the tree, a condition frequently caused by late spring planting or neglect of culture, and drouth. It can be largely averted by using seed or one-year-old thrifty trees, and maintaining a vigorous growth by constant and frequent cultivation.

ARTIFICIAL FOREST.

(SPECIALLY FURNISHED BY HON. WM. SIMS, SECRETARY OF THE STATE BOARD OF AGRICULTURE.)

Table showing, by counties, the number of acres of forest trees one year old and over for the year 1886.

COUNTIES.	Walnut.	Maple.	Honey Locust.	Cotton-wood.	Other varieties
Allen	9	123	1	36	64
Anderson	11	21	.....	2	2,032
Atchison	71	179	9	203	69
Barber	824	2,526	3	21,809	17,250
Barton	145	12	314	326	252
Bourbon	21	89	1	2	35
Brown	86	249	18	572	359
Butler	97	159	1	692	1,590
Chase	50	9	1	21	68
Chautauqua	26	79	3	35	343
Cherokee	24	199	61	42	90
Cheyenne .....	.....	.....	.....	.....	.....
Clark	159	2,872	29	7,316	5,712
Clay	138	257	24	1,486	1,154
Cloud	142	38	13	2,674	1,283
Coffey	16	111	5	21	8
Comanche	1	2	1	87	8
Cowley	80	134	1	525	886
Crawford	172	81	10	18	2,110

ARTIFICIAL FOREST—CONCLUDED.

COUNTIES.	Walnut.	Maple.	Honey Locust.	Cotton-wood.	Other varieties.
Davis.....	43	42	11	157	259
Decatur.....	48	2	9	94	177
Dickinson.....	113	107	7	585	1,080
Doniphan.....	110	110	26	332	1,761
Douglas.....	3	23	1	2	34
Edwards.....	12	9	32	392	35
Elk.....	40	228		93	329
Ellis.....	33		8	112	149
Ellsworth.....	185	53	64	722	852
Finney.....					
Ford.....			1	5	20
Franklin.....	66	68	10	56	155
Gove.....		5	5		
Graham.....	13	3	1	29	488
Greenwood.....	25	25	3	16	4,563
Hamilton.....				250	500
Harper.....	745	6,233	299	25,998	4,325
Harvey.....	109	85	10	1,606	714
Hodgeman.....	34	9	25	24	32
Jackson.....	24	152	11	42	87
Jefferson.....	36	83	9	16	17
Jewell.....	117	107	17	1,581	2,090
Johnson.....	241	264	18	194	1,120
Kingman.....	141	384	13	959	482
Kiowa.....	1	2	1	75	5
Labette.....	24	252	3	48	604
Lane.....					
Leavenworth.....	31	20		3	4,780
Lincoln.....	78	6	37	504	472
Linn.....	14	85		6	29
Lyon.....	17	6	2	364	30
Marion.....	385	129	36	2,858	645
Marshall.....	86	459	12	1,020	826
McPherson.....	336	153	29	2,307	1,402
Meade.....	49	362	107	5,757	2,926
Miami.....	158	74		5	2,373
Mitchell.....	212	27	21	859	977
Montgomery.....	124	200	6	36	579
Morris.....	37	40		145	190
Nemaha.....	116	198	14	389	1,246
Neosho.....	80	132	1	36	76
Ness.....	33	3	2,120	264	4,490
Norton.....	113	32	89	274	307
Osage.....	45	71	3	27	135
Osborne.....	744	14	4,503	963	8,953
Ottawa.....	129	55	6	1,453	717
Pawnee.....	35	35	105	380	434
Phillips.....	125	24	186	395	1,938
Pottawatomie.....	13	184	11	128	265
Pratt.....	196	15	3	542	129
Rawlins.....	12	2	12	20	85
Reno.....	245	92	8	5,100	1,520
Republic.....	96	332	21	2,771	1,557
Rice.....	149	56	7	1,229	1,186
Riley.....	70	79	3	303	122
Rooks.....	218	17	44	575	1,180
Rush.....	36	11	51	383	370
Russell.....	92	48	28	269	206
Saline.....	220	61	37	1,164	836
Scott.....					
Sedgwick.....	171	102	23	2,469	648
Seward.....					
Shawnee.....	28	29		66	3,209
Sheridan.....	4	5	15	9	21
Sherman.....		15		46	
Smith.....	328	35	77	709	1,221
Stafford.....	103	9	4	1,748	446
Stevens.....					
Sumner.....	145	137	45	1,655	1,245
Thomas.....	9	16	12	3	78
Trego.....			2	84	
Wabaunsee.....	56	44		85	1,193
Washington.....	150	219	15	1,916	1,144
Wilson.....	55	143	3	668	191
Woodson.....	6	136		3	800
Wyandotte.....					
Unorganized.....					6
Total.....	9,536	19,248	8,777	109,250	104,378

* Report of 1885; no return for 1886.

FRUIT MANUAL.

The pioneer fruit-growers of Kansas have had immense difficulties to contend with, from the fact that the experience of and the rules laid down by no other State or country could be relied on, either as to varieties, cultivation, or treatment, here; and in consequence, they were under the necessity of groping around in the dark until some light was thrown upon their pathway by the lamp of experience, since which they have made commendable progress. Yet to-day the science of fruit-growing in Kansas is in its infancy, and any attempt to lay down rules for future use is to some extent hazardous, and may at any time be changed by the experience of coming years; but there is a constant and growing demand for some guide to point out to the coming fruit-grower when, where, how and what to plant.

As this Society has been holding meetings for many years, and the members thereof have at these meetings given their experience, reported their successes and their failures, and have discussed the problems brought before them, they feel that they have arrived at some conclusions and have established some facts that will be helpful to the fruit-growers of Kansas; hence the issuing of this Manual.

THE APPLE.

CHAPTER 1.

SECTION 1. *Selecting a Site.*—This is the first thing to be considered in planting an orchard; and in doing this there are many things to be considered, which we will take up in their order. The orchard should be planted near the house, so that the owner can have a constant oversight. But few orchards, to our knowledge, planted any great distance from the house, have been a success. They are almost sure to be neglected, and go to ruin. We would plant it either behind the house, to the right or left, but never in front. If the house fronts the east, and the barn and other out-buildings are at the back of the house, then put the orchard on the north and the garden on the south side of the buildings, so that the buildings and shade and ornamental trees around them will somewhat break from the orchard the strong south and southwest winds that prevail during the growing season. The orchard would also, to some extent, break the cold northwest winds from the buildings. If the house faces the south, it would be best to set the orchard on the north or back of the house, and it will make a splendid background for the house. If the house faces west, we would also prefer having the orchard back of the house, or on the north side. If it faces north, the orchard should be on the east side of the buildings. There are situations where it would be advisable to change the above rules.

SEC. 2. *Elevation.*—Other things being equal, always choose the highest ground on the farm, if convenient to the house. What is meant by "elevation" is that it be high compared with the surrounding lands. The finest fruit, and in the greatest abundance, is generally found on the high grounds. The reason given for this superiority is, that the cold air on still nights, as well as the deleterious gases, settle

on the lowlands, and leave the elevations comparatively warmer, and with a purer atmosphere. There are quite a number of orchards now growing and bearing an abundance of delicious fruit on our low, rich, alluvial bottoms; and many of our members claim that eventually these rich bottoms will be the best locations. This is more owing to the character of the soil and protection from winds than otherwise. The higher elevations are the best places for orchards—especially where protected from the winds.

SEC. 3. *Slope*.—The slope on most Kansas prairies is so gradual, that practically there is no material difference; but if other things are favorable, always select a northern slope.

SEC. 4. *Soil*.—There is probably no fruit grown that so universally and completely adapts itself to all kinds of soil, as the apple; and Kansas is especially fortunate as to the character of her soil for such purposes. The kind of soil that has generally been considered as giving the best results, is that of our high, rolling prairies, where the surface soil is of moderate depth, the subsoil a red clay, with some sand intermixed, and underlaid with limestone. Yet some of the best orchards in the State are on lands where sand predominates, and are underlaid with sandstone. A perfect soil would be one of a mixture of clay and sand, with clay predominating, both in surface and subsoil, underlaid with limestone near the surface. This kind of soil usually contains an abundance of lime, and a good supply of all the elements necessary to perfect fruit and tree-growth, and abounds in this State.

SEC. 5. *Drainage*.—This subject requires less attention in Kansas, probably, than in any other State. Our high, rolling prairies are mostly underlaid with limestone, and this stone comes so near the surface, and is so full of cracks or seams, that no other drainage is necessary; yet orchards planted among “draws,” or low places, that are too wet, would be improved by under-drains.

SEC. 6. *Wind-breaks*.—The members of this Society agree that wind-breaks are needed around the orchard, especially on the south and west sides; but mistakes heretofore have been made in planting them too near the orchard, and too close together in the rows. Fruit trees need and must have an abundance of light and air, to perfect good fruit. Trees for wind-breaks should not be planted less than five rods from the orchard, and not less than eight or ten feet apart in the row. Three rows are sufficient on the north and east sides, and six rows on the south and west sides. High, rapid-growing trees should be planted, to break the force of the wind, but at the same time not to prevent a free circulation of air through the orchard.

CHAPTER 2.

SECTION 1. *Planting*.—The first thing to consider under this head is the time of planting: Shall it be in the fall, or spring? The Society has been divided on this question. Those advocating fall planting claim that the roots partially heal over during the winter, and the earth settles firmly around them, so that the tree is in better condition for early spring growth. Those practicing spring planting say that it is difficult to get the earth well packed around all parts of the roots in the fall, and in consequence they are liable to be damaged by freezing and thawing, and that the high winds switch them about while the ground is frozen, by which they are injured; while if taken up in the spring and immediately set out, they start to grow at once, and are less liable to be injured. Another plan is, to take up the trees in the fall, heel them in, and plant in the spring. A digest of the discussions on this subject furnishes the following conclusions: First, That fall planting is successful if the earth is well and thoroughly packed around all parts of the roots, and the earth

well banked up around the tree, so as to hold it firmly in place. Second, That taking the trees up in the fall and heeling them in, and planting in the spring, can be made successful if the heeling is well done. To do this, the bundles should be opened and each tree put in separately, and the earth well packed around the roots; or, a still better plan, to put them in trenches, with the roots entirely below frost, and the tops partially covered. But the general tree-planter had better take up the trees in the spring, and plant as soon thereafter as possible.

SEC. 2. *Distance Apart.*—There is a wide divergence of opinion as to the distance trees should be set apart—ranging from twelve to forty feet. Those advocating close planting claim that the trees make wind-breaks for each other, and economize ground; that the fruit grown from the trees before they are large enough to crowd each other will amply pay for the extra amount of trees and work; and that when the trees begin to crowd each other every alternate tree can be removed. The advisability of extreme close planting depends largely upon the kinds planted. Early-bearing varieties, such as Winesap, Cooper's Early White, Missouri Pippin, &c., probably will pay to plant close, as they come into bearing, if properly treated, in four or five years, and four to six crops can be grown before they need thinning. Another plan of close planting is, to set them twelve to sixteen feet north and south, and thirty to forty feet east and west. This plan has been practiced by some apple-growers with success, and has some advantages. The trees, being planted close north and south, will soon shade each other, and thereby prevent sun-scald, and at the same time will to some extent break the force of the south and southwest winds that lean so many trees to the northeast; and being planted wide apart east and west, the roots and tops will have room to spread. There is still another mode of close planting that has some advocates, and has been practiced in some localities, viz., planting the main orchard trees thirty to forty feet apart each way, and then planting peach trees midway between the apple trees. The peach, being a short-lived tree, is grown, has performed its mission, and is ready to cut down in its old age, by the time the apple trees are grown large enough to need the space. However, the wisdom of this mode of planting is doubtful. The peach is a gross feeder, and exhausts the ground very rapidly. There is still another plan for close planting, that has some merit, which is, to plant the main orchard the desired distance apart; then plant midway between rows of early-bearing varieties of apple trees—these to be cut out when they begin to crowd. But close planting in any shape is not recommended. It exhausts the soil too rapidly; and when the time comes to thin out, few men possess the nerve to cut down rows of fine, thrifty young trees that required years to grow, and in most cases they would be left standing until the orchard is badly injured. Thirty feet each way is as close as they should be set.

SEC. 3. *Laying off the Ground.*—The usual mode of laying off is, to measure across the ends, and set stakes for each row; then measure or sight across the inside, set a peg where each tree is to stand, and proceed to dig the holes. These holes, experience in Kansas has demonstrated, need not be any larger than is necessary to receive the roots spread out in their natural shape, and deep enough to get the tree down about as deep as it was in the nursery. In light, sandy soil it can be put some deeper, but in clay or heavy soil it should never be set deeper than it stood in the nursery. Several members have for the past ten years been planting their orchards in the following manner, and it has more advantages than any yet recommended: First, procure a half-dozen or more stakes, four or five feet high; set these stakes in line where you want the south row of trees; then, with a steady team, plow and mark out a straight furrow in range with the stakes; have a man follow after and measure the distance for the next row to the north, and set the stakes, then mark out as for the first row; and so on till the north side of the plat is reached. Then set the stakes

north and south one foot east of where the east row of trees is wanted. Begin at the south end, and mark out a furrow in line with the stakes, throwing the furrow to the east; turn back, letting the near horse walk in the furrow; run another furrow parallel with the first one, and about twenty inches west of it; make one more round, and throw out the center, thereby making a dead-furrow where the first row of trees are to stand. Repeat this operation until the west side of the plat is reached. If a good, stout team is used, this will give a dead-furrow running north and south where the rows of trees are to stand, twenty to twenty-four inches wide and eight to ten inches deep, which is about the right depth to plant trees. This completes the laying off, and the preparation of the ground for the reception of the trees. Nothing further need be done, except to go along with a shovel and throw out any loose dirt that may have fallen back where the east-and-west rows cross, or where the trees are to stand.

SEC. 4. *Selecting the Trees.*—Having determined on the location, prepared the ground, and made out a list of the kinds to be used, with a team, and a good supply of wet straw, hay or coarse manure in the wagon, drive to the nearest reliable nursery, and select good, thrifty two or three-year-old trees. See to taking them up. Remove all borers, cut off all haggled roots, trim the tops into the desired shape, and pack them into the wagon, with plenty of wet straw around the roots. Drive into the intended orchard-plat, and set them out as unloaded.

SEC. 5. *Planting.*—Let one man take a tree, set it in the dead-furrow where the east-and-west furrows cross, and spread out the roots to their natural shape; have another man throw on a few shovelfuls of well-pulverized surface-soil, seeing that this is well packed around the roots; then let the man holding the tree tramp the soil well around it while the other man fills up, till the earth is about level with the surface of the ground. The tree when planted should lean somewhat to the southwest. It is best to plant the trees of each variety together.

SEC. 6. *Cultivation.*—The first summer after planting is a critical time for the trees, and they should receive great care. The ground should be kept clean and well cultivated the entire season. The first thing to do in cultivating an orchard should be, to provide short double and single-trees. The double-tree should not be over twenty-five to thirty inches long, and the single-trees not over sixteen or eighteen inches. Make them as short as the team can be made to work with, and always use them when cultivating. With a little care, there is no need of barking the trees. If the trees are planted in dead-furrows, as above described, soon after they are planted close up the dead-furrow with a plow. This completes the first cultivating. In eight or ten days, or when the weeds begin to start, plow the ground again, throwing the furrow to the trees, and running the plow not more than two or three inches deep, going about four rounds to each row of trees. Repeat this three or four times during the season, or as often as the weeds start, running the plow a little deeper each time. This gradually deepens the earth around the trees as the season advances, and by fall we have a deep, mellow bed, about eight feet wide and twelve to sixteen inches deep. All weeds that are not covered by the plow should be cut out with the hoe. On the ground between the rows of trees plant crops that require cultivation, such as corn, potatoes, beans, etc. Corn is the best crop, as it receives cultivation at the time when the trees need it, and affords to some extent protection to the trees from the wind. The second year, commence cultivation by throwing the furrow from the trees, and the next time to them, and so on, keeping the ground clean and well stirred till about the middle of July, when cultivation should cease for the season. Stirring the ground later than this stimulates fall growth, which does not have time to ripen up well, and is liable to winter-kill. The third, fourth, and fifth years, cultivate the same as the second

year, and by this time, if the trees have been well cared for, the early-bearing kinds should begin to fruit. The discussions show that the Society is divided as to the treatment of the soil after the trees come into bearing. Some members practice clean cultivation, with no crop of any kind, while others seed the orchard down with clover, plowing the clover under every second or third year. Which of these modes is best is not decided. So far, both have been successful.

SEC. 7. Pruning.—Pruning is a necessity, but there is a difference as to the amount needed. There has been damage done to apple trees in this State by injudicious pruning. The system of pruning should commence when the trees are quite young, in the nursery, say at one year old, by trimming to one upright shoot, keeping the body clean up to where the head is desired. Just how high the head should be, members differ to some extent, ranging from one to three feet from the ground to the first limbs; but all agree that a low head is one of the essentials of a successful orchard in this State. If the top of the tree is formed high, the strong southwest winds are almost sure to lean it to the northeast, and sun-scald on the southwest side of the body is almost sure to follow; whereas if the head is formed low, the tree is not as liable to lean, and if it does, the low head in most cases will shade the body. Low-headed trees bear fruit more regularly than high ones; in fact, some years the lower limbs are loaded with fruit, while the upper branches have but little. The nurseryman should form the heads of trees low, ranging from one to three feet, and urge upon his customers the necessity of using such trees. In the old orchards of the State where the heads are formed low, not one in a hundred is sun-scalded, and where the heads are five to seven feet up from the ground, half or more are scalded, and many are killed outright. If the nurseryman has performed his duty, and trained the head into proper shape, and a tree-digger is run under the trees before taking up, but little pruning will be needed at the time of transplanting, as the tree-digger only cuts off the tips of a portion of the roots; especially is this the case where the trees are transplanted at two years old. The tree-digger should always be run under them when two years old, whether they are transplanted or not, and again run under when taken up. Trees that are taken up with the tree-digger are worth much more than when taken up with the spade. The roots are cut a uniform length, and are never haggled or bruised. If the digger is run under at two years old, and they are allowed to stand until they are three years old, it checks the too-rapid growth of the top, and forces the formation of all the fibrous roots immediately around the tree, and when transplanted they are taken up with the tree.—After the orchard is planted, the trees should be watched for the first four to six weeks, and any trees that show signs of dying can sometimes be made to grow by cutting back the top. But this class of trees should be replaced with good ones from the nursery the next season. During the first summer after planting but little cutting need be done, except to keep the water-sprouts off. The second year begin to form the head of the tree, by encouraging the growth of one upright center shoot, with side branches every six or eight inches, cutting out all intermediate branches. Keep up this system each year thereafter. Be careful to so shape the tree that when it is grown no large branches need to be removed. When the trees come into bearing, do as little pruning as possible immediately after they have borne a heavy crop of fruit, or when they are exhausted. Two objects are to be gained in pruning: first, to form the tree into the desired shape; second, to so form the head as to let as much light as possible into all its parts. Nature should at all times be allowed, as far as possible, to do the work of forming the tree into shape, and interference with her work often does more harm than good. Some varieties have upright, close-growing heads, while others are spreading and irregular. Each kind should be allowed to form the head in its own way as far as possible.

CHAPTER 3.

SECTION 1. *Necessary Tools.*—In gathering apples, as in doing any other work, it is necessary to have the right kind of tools to work with. The first thing in this line is a rig for the wagon, suitable for hauling apples. For a wagon rig, make a platform 40 inches wide, 14 feet long, of 2-inch plank, with 2x4-inch cross-pieces underneath, at each end and in the middle, with a 4-inch bolt through each plank where it covers the cross-piece. Put it on the wagon, and make a notch to fit the standards. This platform is the best wagon rig for hauling barreled apples upon. It holds two barrels side by side, and sixteen barrels can be loaded on it with ease; is very convenient in loading and unloading, and has considerable spring to it. When the wagon is loaded, put a pin or stake in the rings of the standards, and slip a common fence-board between the stakes and barrels; this keeps the barrels from tipping. Now tie a rope across, behind and before, and it is in shape to be hauled anywhere with safety.

SEC. 2. *Sorting-Box or Table.*—For sorting apples, use a shallow box 3 feet wide by 4 feet long, and 4 to 6 inches deep. This box can be set on a couple of barrels, or legs can be put to it. Tack a piece of old carpet or piece of heavy cloth on the bottom, so the apples will not bruise while being poured in, and the sorting-table is complete.

SEC. 3. *Picking-Sacks.*—Take common seamless sacks, put a hoop in the mouth of each to hold it open, then tie the bottom and top together, and throw it over the shoulder in same manner as for sowing grain. These sacks are fully as convenient for picking apples from the trees as a basket, and the fruit is bruised less.

SEC. 4. *Ladders.*—The ladder for getting up into trees should be about 12 feet long, 2 feet wide at the bottom, and tapering to a point at the top; made of 1½x4-inch pine for the sides, and good tough hickory for the rounds. This makes a good strong ladder, easily handled, and can be run up into the tree anywhere.

SEC. 5. *Barrel Press.*—The barrel press consists of a piece of oak, 4x4, 20 inches long, with a common inch bench-screw running down through the center. On the ends are bolted flat iron rods; these rods run down, and have hooks on the lower ends, so as to catch onto the under side of the barrel. This press is used to press the heads into barrels after packing.

SEC. 6. *Barrels.*—Barrels are the best of all packages in which to handle apples, and the sooner they are packed into them after picking, the less liable they are to injury; hence is recommended packing in the orchard. The flour-barrel size for apple barrels, 28-inch stave and 17½-inch head, is the best. A barrel of this size holds about three bushels, and is fast becoming the standard size all over the West. These barrels are made in large quantities by machinery, and are furnished in what is called "knocked-down" shape; that is, the staves are cut the right length, width and thickness, and beveled. The heads are turned the right size; hoops are cut, and put up in coils; and all are tied up in suitable packages for handling or shipment. With the material thus furnished, a good cooper will set up thirty to fifty per day, and any man handy with tools can soon learn to set them up. A supply of barrels should always be provided before picking-time commences.

CHAPTER 4.

SECTION 1. *Time to Gather.*—The time to gather most varieties of apples is when they have attained their full size and are well colored. Some kinds, that hang on well, and are intended for immediate use in the family, may be allowed to stay on the tree until fully ripe. But where they are intended for shipment or storing away, they must be picked before they get mellow, or they are sure to be injured in handling, and will not keep.

Sec. 2. *Picking*.—Having everything ready, and the fruit being at the right stage for picking, move the outfit into the orchard, setting the sorting-table in the center of a block or group of trees. The pickers gather the apples one by one from the trees, putting them into the sack, and when about a half-bushel is in the sack, empty them upon the sorting-table. When all are picked within a reasonable distance, move to the next block, and so on. When the apples are hard to pull, give them a little twist while pulling. If the trees are reasonably full and the fruit of fair size, each picker ought to average fifty bushels per day.

Sec. 3. *Sorting*.—As the apples are picked and emptied upon the sorting-table, one or more hands should do the sorting and packing. They should be sorted into four grades, the first embracing all good sound fruit above a certain size—say about seven inches in circumference; this grade pack into the barrels. The second grade should consist of all above that size that are bruised or damaged in any way; this grade can be evaporated to advantage, or can be made into cider, apple butter, vinegar, or jelly. The third grade should contain all sound fruit below the first size named; this can be worked into cider, jelly, or vinegar. The fourth grade should embrace all rotten apples, and should be fed to the hogs.

Sec. 4. *Packing*.—Set the barrel near the sorting-table in the orchard, and take out one end; select good, fair, average, uniform-sized apples for “facers;” put these in the bottom of the barrel, in layers, stem end down, and pack close together; put in two layers; then fill up the barrel, shaking it well while filling, and rounding up about one inch above the chimb; apply the press, and force the head into place; drive down the hoops, and nail in the “liners;” drive four to six four-penny nails through the upper hoop into the head; see that all the hoops are nailed so they will not slip off; turn the bottom end up, and nail and line this end, and mark the name of the variety and proprietor on it; remembering always that this is the opening end. This completes the packing, and the apples are ready for sale or shipment. An apple has a certain amount of “give” or “spring” in it, and it can be pressed to that amount without bruise or injury, and when so pressed into the barrel it can be rolled about or handled without injury. Whenever in handling they are found to be loose in the barrels, and are shaking about, the barrels should be immediately opened, and the fruit repacked, or it will be ruined.

Sec. 5. *Gathering for Storage*.—When the apples are intended for storage, it is not necessary to pack in barrels. Boxes 2 feet long, 16 inches wide and 8 inches deep, sides and bottom made of half-inch and the ends of inch lumber, with holes cut in each end for “hand-holds,” make excellent receptacles with which to handle apples in the orchard. These boxes hold about one bushel, and can be set on the platform of the wagon, and taken into the orchard and filled by the pickers while on the wagon; and where the fruit is scattering, this is the most convenient way to gather it, even for packing. It can be hauled to some central point for packing, or to the place of storage, and can be sorted from the boxes nearly as well as from the sorting-table. These boxes cost much less, and will last longer, than bushel baskets, and are equally as handy; and when enough of them are made, they are an excellent thing in which to store away the apples.

Sec. 6. *Fruit-House*.—A vast deal of time and thought has been spent in deciding upon a good place for storing fruit. A large per cent. of our most delicious kinds are so perishable that they last but a short time. The apple, however, with proper treatment, with our early and late varieties, and a good fruit-house, can be kept in good condition the year around. A fruit-house must be built of such material, and the walls of sufficient thickness, as will keep out frost. Brick, stone and wood are the materials nearly always used. Either answers the purpose; wood is the best non-conductor. They can be put under or above ground. Cellars under buildings are

most in use. They should be so arranged that the temperature can be regulated at will. Experience has demonstrated, time and again, that fruit keeps best, and undergoes less changes, when the temperature is kept just above the freezing point; and the fruit-house that can be kept at this point will answer all purposes. There are two ways to do this: One is to keep a sufficient quantity of ice in the building to keep the temperature down to the desired point; and where large quantities of fruit are kept, this is undoubtedly the best plan; but with most fruit-growers, this is not practicable. Second plan: The varieties intended for keeping are generally picked in October, and by this time the nights are cool; and after the fruit is put in, the doors, windows or ventilators should be kept open at night, so as to give free circulation to the air in all parts. This will cool off the fruit and the inside of the building or cellar, and if shut up in the morning, will retain a low temperature all day. Of course, when winter sets in, it will be necessary to keep it closed most of the time; but by a little care, the temperature in this way can be kept down to nearly the desired point the greater part of the time.

SEC. 7. *Storing Away the Fruit.*—It is not material just how the apples are stored away. They can be stored in bulk, in barrels, or in boxes. If stored in bulk, the piles should not be too large, as they will generate some heat. Some fruit men practice storing apples in sheds, out-houses, or on the north side of a building, or in any cool place where there is a free circulation of air, and leaving them there until the weather becomes cold. This plan works well, but requires unnecessary handling, and sometimes they are left too long, and are caught by the cold.

SEC. 8. *List of Varieties of Apples Recommended for Planting in Kansas.*—(See Voted Fruit List, in this volume.)

THE CHERRY.

This fruit has become a general favorite throughout the State. Its easy culture, hardiness and heavy productiveness of the tree, and the value of its fruit for general uses, have caused a large planting in Kansas. It thrives quite well on either high or low lands, and on sandy and loamy soils. The Morello family is highly successful wherever planted, and embraces the sour varieties, Early Richmond, Kentish, Montmorency, English Morello, and common red (black) Morello. In some localities the finer-flavored varieties—as May Duke, Gov. Wood, Royal Duke, Belle Magnifique, Belle de Choisy, Reine Hortense—are quite successful. The class known as “sweet varieties” do not succeed. The tree often becomes fatally injured by the intense heat of summer and the extremes of winter weather.

The main requisites in successful culture are deeply prepared and enriched land, where not so by nature, and a vigorous wood-growth. Whenever a tree becomes stunted by neglect or from sterility of the land, decay soon sets in at the heart, and death generally follows in a few years.

CHAPTER 1.

SECTION 1. *Site*, for this as well as for all classes of soft fruits, should be as near the dwelling as practicable for convenience in gathering the fruit, and general care of the orchard.

SEC. 2. *Elevation.*—High lands are preferable, as the fruit buds are less liable to be injured by spring frosts, and the tree maintains a normal condition better, through varying weather in winter, and better facilities are afforded for circulation of the currents of air during extreme rainfalls and sudden changes in temperature.

SEC. 3. *Slope*.—An eastern or northern slope is preferable, as trees do not suffer so much from drouths or heat of sun on such locations. The slope should be sufficiently inclined to readily pass off any sudden, heavy fall of water, as a retention of a surplus amount in the land will weaken the vigor of trees, and where continued endangers their lives.

SEC. 4. *Soil*.—A deep loam and a sandy soil are to be preferred; but other soils can be made suitable by deep tilling and manuring, and for naturally arid land, a heavy mulching.

SEC. 5. *Drainage*.—When planted on flat lands, some artificially-constructed drains must be provided; but on slopes water is seldom retained in amount that would be deleterious to trees. The value of ample drainage is forcibly impressed on the grower when heavy and continuous rains flow the land just at the ripening period, which is invariably followed with cracking and often bursting of the fruit, thereby rendering almost the entire crop unmarketable, and a serious loss. No such an occurrence would follow on well-drained grounds.

SEC. 6. *Wind-breaks*.—In open prairie lands wind-breaks are an advantage, when confined to the south side only. These should be constructed with two rows eight feet apart, and the trees set at same distances, alternating in the row.

CHAPTER 2.

SECTION 1. *Preparation of the Land*.—Deep plowing and pulverizing of the surface and stirring of the subsoil are as much needed with the cherry as any of the orchard fruits. The depth can be obtained by a repeated following in the same furrow, until the desired condition is reached. Sterile lands must be well enriched with barnyard manure or wood ashes, or any well-rotted vegetable matter, before planted.

SEC. 2. *Selecting of Trees*.—These should never be over two years old; strong, vigorous growers, and well rooted. A second-class tree is never cheap, and their use is a very questionable economy; better plant fewer trees of the first class, than use them on account of the difference in the cost. As to the character of stock on which the kind has been worked: Of these there are three kinds, viz., Mahaleb, Mazzard, and common Morello. To these the objections have been made that the Mahaleb is short-lived, Mazzard not at all times hardy, and the Morello sprouting profusely from the root. The tendency of the remarks and discussions at the meetings of the Society have been towards the Morello as a preferable stock, claiming early and profuse fruiting and hardiness over the other classes. To the use of this stock the main objection comes from nurserymen; and in addition to the above-stated objection, that it is a difficult stock to work. While there is no question as to the hardiness and abundant fruitage of those trees worked on this stock, one of the most valuable orchards in the State was table-grafted on the Mazzard stock. The continuous annual yield, and longevity and vigor of the trees, have been remarkable. But much of these conditions undoubtedly can be clearly traced, and is due, to unexceptionally kind treatment given annually to the orchard, and more credit is due to this treatment than to the class of stock used.

SEC. 3. *Laying off the Ground*.—The usual method of laying off is, to measure across the ends, and set stakes for each row; then measure or sight across the inside, set a peg where each tree is to stand, and proceed to dig the holes. These holes, experience in Kansas has demonstrated, need not be any larger around than is necessary to receive the roots spread out in their natural shape, and deep enough to get the tree down about as deep as it was in the nursery. In light, sandy soil it can be put

some deeper, but in clay or heavy soil it should not be. Several of our members have for the past ten years been planting their orchards in the following manner, and we consider it as having more advantages than any yet recommended: First, procure a half-dozen or more stakes, four or five feet high; set these stakes in line where you want the south row of trees; then, with a steady team, plow and mark out a straight furrow in range with the stakes; have a man follow after and measure the distance for the next row to the north, and set the stakes, then mark out as for the first row; and so on till the north side of the plat is reached. Now set the stakes north and south one foot east of where the east row of trees is wanted. Begin at the south end, and mark out a furrow in line with the stakes, throwing the furrow to the east; then turn back, letting the near horse walk in the furrow; run another furrow parallel with the first one, and about twenty inches west of it; make one more round, and throw out the center, thereby making a dead-furrow where the first row of trees is to stand. Repeat this operation until the west side of the plat is reached. If a good, stout team is used, we will have a dead-furrow running north and south where the rows of trees are to stand, twenty to twenty-four inches wide and eight to ten inches deep, which is about the right depth to plant trees. This completes the laying off, and the preparation of the ground for the reception of the trees. Nothing further need be done, except to go along with a shovel and throw out any loose dirt that may have fallen back where the east-and-west rows cross, or where the trees are to stand.

SEC. 4. *Distance Apart.*—The cherry tree is a close grower, forming either an upright or low, round head, according to varieties. In either case it requires little room. But for convenience in cultivation and other work in the orchard, the rows should be twenty feet apart, and trees fifteen feet in the row.

SEC. 5. *Planting.*—First, time for planting: Many trees fail because planted too late in the spring, and many more fail because planted in the fall. The safest time is in the spring, and it should be done as soon as the winter's frost has left the ground, and without fail before the buds become swollen. Let one man take a tree, set it in the dead-furrow where the east-and-west furrows cross, and spread out the roots to their natural shape; another man to throw on a few shovelfuls of well-pulverized surface-soil, seeing that this is well packed around the roots; then let the man holding the tree tramp the soil well around it while the other man fills up, till the earth is about level with the surface of the ground. The tree when planted should lean somewhat to the southwest. It is best to plant the trees of each variety together.

SEC. 6. *Cultivation.*—The first summer after planting is a critical time for the trees, and they should receive great care. The ground should be kept clean and well cultivated the entire season. The first thing to do in cultivating an orchard should be to provide short double and single-trees. The double-tree should not be over twenty-five to thirty inches long, and the single-trees not over sixteen or eighteen inches. Make them as short as the team can be made to work with, and when cultivating always use them. With a little care, there is no need of barking the trees. If the trees are planted in dead-furrows, as above described, soon after they are planted close up the dead-furrows with a plow. This completes the first cultivating. In eight or ten days, or when the weeds begin to start, plow the ground again, throwing the furrow to the trees, and running the plow not more than two or three inches deep, going about four rounds to each row of trees. Repeat this three or four times during the season, or as often as the weeds start, running the plow a little deeper each time. This gradually deepens the earth around the trees as the season advances, and by fall we have a deep, mellow bed about eight feet wide, and twelve to sixteen inches deep. All weeds that are not covered by the plow should be cut out with a

hoe. On the ground between the rows of trees we would plant crops that require cultivation, such as corn, potatoes, beans, etc. Corn we regard as the best crop, as it receives cultivation at the time when the trees need it, and affords to some extent protection to the trees from the wind. The second year, commence cultivation by throwing the furrow from the trees, and the next time to them, and so on, keeping the ground clean and well stirred till about the middle of July, when cultivation should cease for the season. Stirring the ground later than this stimulates fall growth, the wood of which does not have time to ripen up well, and is liable to winter-kill. The third, fourth and fifth years, cultivate the same as the second year, and by this time, if the trees have been well cared for, they will have become well established in fruiting. After this, if cultivation is not continued, the land should have each year a liberal dressing of stable manure and litter. Cherry trees must be kept in a vigorous, growing condition each year, and if such varieties as adapt themselves to our climate are used there will be but few failures until their natural time of life is run.

SEC. 7. *Pruning*.—It is generally conceded by all progressive orchardists that pruning is a necessity, the only difference being as to the extent. The main points to be gained in this work are: First, a low and uniformly-shaped head; second, to facilitate the penetration of light and air to the inner portions of the head; third, to encourage and direct the annual growth so as to form a shade sufficient to break the force of the sun's intense heat upon the branches and trunk of the tree; fourth, to remove all chafing, straggling and succulent growth. It should be done mainly while the tree is young, and in the spring before the buds break into leaves. Succulent growth should be removed as soon as it appears.

CHAPTER 8.

SECTION 1. *Necessary Tools—Ladders*.—Of these the only convenient form is the common adjusting folder, which is easily manufactured by using for the sides two-inch pieces of common lumber, six inches wide and from six to ten feet long, as occasion may require. Into these are grooved steps of same width at easy stepping distances, fastened with nails or screws, each supported by cleats on the under side. The top should be constructed with a platform step eight inches wide, on which to rest the picking-boxes and for the picker to stand upon whenever necessary. This style is found at almost any store dealing in hardware or agricultural implements, and is generally used while the trees are young and low-headed. As the trees become large and tall, the staging platform is far the best. This is constructed on the plan adopted by plasterers for the finishing of inside work in buildings, viz.: two wooden horses are made of the required height for convenience of the pickers, and placed at safe distances apart along the sides or under the branches of the trees, and on their tops is constructed a platform where one or more pickers may stand and do the work. These have the advantage of accommodating several persons at a time, are movable, and easily shifted from place to place.

SEC. 2. *Picking-Crates*.—These are made of light but strong material, and of necessary size to receive four common berry boxes side by side. This crate is suspended to the picker, adjusted to a convenient position in relation to the work and in front of him, thus relieving both of his hands to be used in picking.

SEC. 3. *Boxes and Crates*.—The common style which is used for berries is well adapted to use in gathering a cherry crop.

SEC. 4. In an orchard of any extent a small shanty or packing-room should be provided. It will also be found convenient for storing the fruit against exposure, as well as shelter for the pickers from a sudden rainfall. In this may be constructed a facing and packing-table.

CHAPTER 4.

SECTION 1. *Time to Gather.*—If for shipping, the best time will be when wholly covered with a light-red color—approaching scarlet; if for a near market, then a dark-red color.

SEC. 2. *Picking.*—Having everything ready, the picking force should be divided into two classes. The first proceeds to gather all the fruit within easy picking distance while standing on the ground, and should keep in advance of the second class, which works from ladders or staging, and cleans up the tree. Cherries must be picked by the stem, and not by taking hold of the fruit, and care must be taken not to even start the stem from the fruit, for if that occurs the juices will flow out, and all such fruit will quickly spoil. None but sound and ripe specimens should be placed in the boxes, and the top layer in every box should be an honest index of the whole. With the “picking-crate” swung to the picker, he has every facility for doing his work well, and quickly detecting any damaged or inferior fruit before it is picked. As soon as the boxes in the picking-crate are filled they are taken out and placed in a shipping-crate, and others put in their place, and the crate when full carried to the facing-table.

SEC. 3. *Facing and Packing.*—The first consists in turning the stems of all fruit in the top layer down, which will give the appearance of a solid surface to the box. All boxes should be filled a little above their edges, to avoid the semblance of stinted measure, and provide for the inevitable settling sure to follow the racket of transportation. As fast as faced, pack them in the shipping-crate, the best being the 24-box crate, close up securely, brand with name of variety, and name of grower and consignee, and send to destination at once. This fruit is never so attractive as at the time when taken from the tree, and the sooner it is placed in the market the more readily it will sell. The practice of facing, above described, is receiving severe criticisms in some prominent circles, as offering too great temptation to dishonest conduct.

SEC. 4. *Storage, for the Purpose of Holding.*—The product can be safely held in a cold-storage for several days, but must be quickly used when taken out; and especially is this an advantage to the grower in seasons when the yield is abundant, and the market overstocked.

SEC. 5. *List of Varieties Recommended for Planting in Kansas.*—(See Voted Fruit List, in this volume.)

THE GRAPE.

The grape finds a home in Kansas. Nearly all varieties, both new and old, are successfully grown in some portions of the State. But not all soils or locations are adapted to all varieties; hence, a judicious care must be given to selecting of lands, with regard to their adaptation to the varieties intended to be used.

There is no home so small, no door-yard so crowded, but will afford ample room for one or more grape-vines, which may be trained on the porch or even the gable-end of buildings. Their roots will follow down the cellar wall, or occupy the ground under the porch floor, and thrive.

CHAPTER 1.

SECTION 1. *Site.*—A vineyard should not be planted too near the poultry-yard, or a timber lot, because of the liability to destruction of its crop of fruit by poultry and birds.

SEC. 2. *Elevation*.—High lands are preferable, as such oftener escape late spring or early autumn frosts, and afford the needed circulation of air among the vines, which to some extent will avert the tendency of the fruit to rot. On such lands the wood matures best, and the fruit is of the best quality.

SEC. 3. *Slope*.—A southerly or easterly-sloping location is preferable. A northern slope will produce the finest-appearing fruit for market, but not the best in quality.

SEC. 4. *Soil*.—It should be of an ordinary fertility, and such as would yield a fair crop of corn. Gravelly and sandy soils having a loose subsoil are preferable; rich, loamy lands are objectionable.

SEC. 5. *Drainage*.—All soils retaining a surplus of water should have drainage, both of the surface and subsoil.

SEC. 6. *Wind-breaks* are not essential to the success of a vineyard, excepting on the western prairies, for a protection from sweeping winds, and to prevent the snow from being swept off the land, as it forms an excellent protection to the roots of plants.

CHAPTER 2.

SECTION 1. *Preparation of the Ground*.—Deep plowing of the surface, and stirring of the subsoil to the depth of fifteen or eighteen inches, is essential. This, followed by thorough harrowing, will place the land in proper shape for planting.

SEC. 2. *Planting*.—Spring-time is generally preferred, and not until the ground has become warm. This will occur generally between the first and fifteenth of April.

SEC. 3. *Distance to Plant*.—Slow-growing vines, like the Delaware, do not require as much space as the Concord. Therefore, the character of the plant to be used should govern the distance. For a general rule, the distance may range from seven to nine feet for the rows, and the same for plants in the row.

SEC. 4. *Laying off the Ground*.—Stake off the land in rows, at the distances apart desired, and with a plow open a furrow along the line of stakes, until the desired depth for planting the vines is obtained. Then stretch a line across the plat in an opposite direction, and at the point of crossing each furrow set a vine.

SEC. 5. *Selection of Plants*.—A strong one-year-old, having a good supply of fibrous roots, is preferable.

SEC. 6. *Planting*.—The vines should have their tops cut back to only two buds, all bruised and damaged portions of roots removed, and kept moistened and protected from exposure to winds and sun, while planting along the line at the crossing of the furrows. All roots must be spread out in a natural position, covered with well-pulverized dirt, and filled up well around the plant and tramped down. In sandy soil set the vines deep; in clay lands it is best to plant shallow.

SEC. 7. *Cultivation*.—The first year it should be thorough, and the ground kept free from weeds, but should cease by July 1st. Some vineyardists grow crops of beans, cabbage, potatoes or tomatoes between the rows, to utilize the ground, and partly compensate for the expense of culture, while others discountenance any use of the land.

SEC. 8. *Pruning*.—In the eastern portion of the State, trimming may be done in early spring, and before the sap has started to flow, while in the western part of the State fall-time is recommended, and as soon as the vine casts its leaves, by removing all of the cane to the two or three buds nearest the ground, and then covering the plant with straw or dirt. The following spring remove all the canes excepting two or three of the strongest, which should be tied to stakes. The following spring one cane, about three feet long, may be left on all strong vines for fruiting, but all the weak ones should be treated in manner recommended for the previous spring. Young vines must not be allowed to overbear, for an injury may occur from which

the vines may never recover. For the following year each strong vine may be permitted to carry two canes, cut back to four feet in length.

Summer Pruning.—As the "forms" (fruit clusters) appear, pinch off the shoot about one joint beyond the last "form;" also remove all weakly forms and shoots, excepting three or four of the strongest, which are for the next year's bearing canes. They are to be treated the following spring the same as recommended for the spring of the third year, and the old canes removed.

SEC. 9. *Trellising and Training.*—Trellises should be constructed in the spring of the third year, by getting the material onto the ground during winter, and the posts sharpened. As soon as frost leaves the ground they can quite easily be driven, and are much firmer by this process than can be made by setting in a hole with the earth tamped down around them. The post at the end of each row should be heavy, and well braced, to resist the strain of the wires when stretched upon them. The lower wire should be at least three feet from the ground, and each of the others above it one foot apart. On these the canes should be fastened in fan shape, and to each of the lower wires.

CHAPTER 3.

SECTION 1. *Handling the Fruit.*—As the fruit will keep but a short time, it should be marketed as soon as ripe, and packed in the common grape baskets, which may be of different sizes for convenience of customers. Before packed, all defective berries should be removed, and clusters then placed with the stem downward. If for a distant market, they must be picked before fully ripened.

SEC. 2. *Varieties Recommended.*—(See Voted Fruit List, in this volume).

THE PEACH AND NECTARINE.

CHAPTER 1.

SECTION 1. *Selecting a Site.*—For the northern sections, we would recommend a sheltered location on the north or northeast of a wood or hill, for the purpose of averting the danger of trees and fruit-buds being killed in winter, or by late spring frosts. For sandy soils, an open, elevated site is preferable, to admit of a free circulation of air.

SEC. 2. *Soil.*—The peach thrives best on a loose, dry soil, well underdrained, naturally or artificially, and reasonably enriched with decayed organic matter. Such as is well adapted to the growth of corn is equally adapted to the peach. On light soils, the earlier will the tree bear and ripen its fruit, but the sooner will both fail.

CHAPTER 2.

SECTION 1. *Procuring Trees.*—Your committee would recommend purchasing of the nearest reliable nurseryman, and such as are grown at his nursery, and he will guarantee to be true to name. This will place the planter in direct business relations with the grower, who can hold him responsible for mistakes or any dishonesty.

SEC. 2. *Time for Planting.*—Trees may be planted safely on sandy land during autumn. If trees have been grown on rich land their growth will be somewhat soft, and when planted in the northern latitudes in the fall may suffer injury during the winter, while if kept deeply "heeled in" over winter, they will suffer little or no injury. In either case it is best to secure the trees in autumn. Where trees are to be

"heeled in," a well-drained location should be selected, and one free from grass, weeds, or rubbish, which form a covert for mice. Dig a trench sufficiently deep and broad to admit all the roots; place a single layer of trees at an angle of about 30° with the general surface of the land; cover the roots with mellow earth, well mixed in and tramped, and up to the lower branches; then add another layer, overlapping the first, and so continue until all are trenched. Plant as early in spring as the land can be prepared.

SEC. 3. Preparation of Ground.—It should be thoroughly and deeply plowed and harrowed, until in best possible condition for planting.

SEC. 4. Distance.—If the trees are to be grown under the "heading-in" system, sixteen feet apart each way is sufficient; but if on the "full-growth" system, eighteen feet is far the best for easy cultivation.

SEC. 5. Laying off the Land.—With a bundle of laths and an eighteen-foot pole, set a row on each opposite side one way, and one row in the middle, placing a lath at each eighteen-foot point; then, with a steady team, run a furrow on the line of the laths across the ground. Returning on same line, run another furrow from the first, turning the ground in an opposite direction; then replace the laths for "sighters" when planting.

SEC. 6. Planting.—First, prepare a mud-hole near where the trees are "heeled in," of sufficient size to admit the roots. Only a few trees should be taken from the trench at a time, and all bruised and broken roots cut off and the tree carefully examined for borers; then plunge the roots into the mud-hole, to give them a coating to protect from exposure to the air. Let one man hold the tree in the place indicated by the lath, another range it the opposite way by sighting from lath to lath across the ground; spread out the roots in a natural position, have another to throw onto the roots a few shovelfuls of well pulverized surface-soil, packing it well among and over the roots, and fill up till the earth around the tree is on a level with the general ground; when planted, the tree should lean slightly to the southwest. The varieties should be planted in succession; earliest ripening, near the entrance of the orchard, and others according to their ripening season, progressively, to the rear. Three or four inches of mulching, in depth, and three feet in diameter, around the tree, will keep the land moist in seasons of drouth, and prevent loss. When planted the branches should be trimmed close, and the main stem cut back to a uniform height of about three feet; this is essential to secure a good growth the first year, and in some cases the life of the tree depends upon it.

SEC. 7. After-Treatment—Cropping.—The orchard land between the rows may be planted with corn for the first two or three seasons, and thereafter plowed at least twice each year as long as the trees live. This should be done from the middle of April to the middle of May, and the middle of September and October. A small plow—ten or twelve-inch—is the best for such work. In the spring plowing, furrows should be turned from the trees; in the fall, towards them. A cultivator and harrow should be freely used during the fore part of the season.

SEC. 8. Pruning.—During the month of June, all straggling branches should be cut back, and all branches and suckers below the intended height of head removed. "Cutting in." Some growers practice this system annually. Downing and others equally noted commend it, while extensive peach culturists growing this fruit for market, prefer to plant new orchards every few years. "Cutting in" is done by cutting back about one-half of the current year's growth in July and August, or early the following spring. By this process a large amount of new branches are formed near the main stem and near the ground, for fruiting the following season. It also invigorates and prolongs the life of a tree, and the fruit is larger and richer in quality. Further, it facilitates the capture of the curculio under the "jarring process."

CHAPTER 3.

SECTION 1. *Necessary Tools—Ladders.*—The self-supporting ladder, six to ten feet in height, is the most convenient form. It is made of two pieces of inch boards, six inches wide, for the sides, into which are grooved steps of same width at easy stepping distances apart. On the top is a platform about eight or ten inches wide, on which a picking-basket may rest, or the picker may stand when necessary. The top is secured by an iron rod.

SEC. 2. *Baskets.*—A convenient form for use in gathering the fruit is constructed of elm or basswood flats, twenty inches long, twelve inches wide, and six deep, holding one-half a bushel.

SEC. 3. *Crates.*—The standard one-third-bushel size in general use is 22½ inches long, 8 inches deep, and five inches wide, and constructed of basswood for the ends and center and yellow poplar for sides and bottoms. A neat, tasty box assists the sale of fruit, and it is to the interest of the grower to use the best.

SEC. 4. *Packing Platform.*—This is made 4x16 feet, with flooring or ship-lap lumber, securely nailed to four or five supports or sills of 2x6-inch scantling, and when in use rests on the ground; it is easily moved to different portions of the orchard to suit the picking.

SEC. 5. *Picking.*—Plenty of ladders, baskets and crates should be provided in time for this work. The fruit must be mature but not ripe when picked, or it will shrivel, lack in proper color and flavor, and command a low price in the market. On the other hand, if over-ripe it will bruise and rot in shipping, and the profits will be materially lessened. The best test of maturity is in feeling of the fruit. If it yields under a gentle pressure of the hand, it is matured; if it does not, it is too green. If it indents, it is over-ripe, and will not do for shipping. The fruit is picked into baskets in the bottoms of which has been placed a thin layer of tender young twigs, which will prevent bruising.

SEC. 6. *Packing.*—The packing is done directly from the baskets of the pickers. Extra boxes or baskets should be provided, into which may be cast over-ripe and damaged, inferior fruit. The crate is placed endwise to the packer. He places two large or three medium-sized peaches in the end next to him, holding them in place with his left hand; and he repeats this process until the crate is filled three-fourths of an inch above the tops of ends and center; the lid is nailed to the nearest end, and then pressed down to place and nailed securely. Two grades should always be made in packing; all over-ripes and culls should be carefully excluded. Mark each crate with name of variety and the grower, and send it to market to take its chances on its merits.

SEC. 7. *Culture after the Crop.*—After the crop is gathered, give the land a plowing and a liberal application of wood ashes and stable manure, to renew vitality, prolong the life of the tree, and produce successive crops of luscious fruit. A neglect of these requirements will result in failure and a loss of capital employed.

SEC. 8. *Varieties.*—It is not advisable for the ordinary grower to plant too many sorts. A list is here given of standard, well-tested varieties, from the earliest to the latest ripening. The commercial planter will select only those which in his judgment are adapted to his purpose. (See voted Fruit List, in this volume.)

THE PEAR.

This fruit is recognized and appreciated by the masses as one of the most luscious of all the classes brought under cultivation, and at the same time as of the most difficult and uncertain, in a large portion of the State. Such has been the uncer-

tainty that few people have the needed confidence to plant more than a few trees, and, to use a common phrase, "to chance it." This lack of confidence too often leads to neglect, which in many instances becomes the prime cause of ultimate failure. That this fruit may be successfully grown in quite a large portion of Kansas, is beyond a doubt. Some localities are far better adapted to its culture than others, and the same may be truly said of all classes of fruit now being cultivated in the State.

CHAPTER 1.

SECTION 1. *Site*.—It should be selected near by the dwellings—other requisites being present—for the convenience of giving proper care in culture, protection, and handling the fruit.

SEC. 2. *Elevation*.—The highest locations are the most desirable, as affording the facilities of drainage and necessary circulation of air, and an escape from disastrous spring frosts, as the tree is naturally an early bloomer.

SEC. 3. *Slope*.—Avoid a southern or western slope; all others are preferable, and an eastern the best.

SEC. 4. *Soil*.—This subject naturally divides itself into a selection between the two classes of trees, known as "standard" and "dwarfs." We will consider the first class, viz., "standards." These are trees grown by propagating the pear cion or bud on the pear root. It thrives best on a sandy or reddish shale land, having an open, porous subsoil to a great depth, for the reason that the pear roots naturally descend into the lower strata, and are most healthy in a well-drained surface and subsoil—conditions always present in soils of the above characterization. Under such conditions the elaboration of food is natural; the deposits are made at the proper season, and mature into a character of ripeness capable of resisting attacks of disease, of enduring drouths, and the extremes of heat and cold. With such trees there can be no questioning the character of the fruit product or longevity of the tree. The second class, viz., "dwarfs," are trees produced by budding the pear onto the quince stock. The roots are of a fibrous character, and take kindly to a loamy soil with a clay subsoil, or even a general clay land; and as the larger portion of the soil formation in the State is of this character, I am convinced that the dwarf is the safer class to use.

SEC. 5. *Drainage*.—Ample drainage of both surface and subsoil is one of the indispensable requisites to a successful pear culture, and no orchard will thrive, or even live, for any length of time on land saturated with or which retains a surplus of water.

SEC. 6. *Shelters, or Wind-breaks*.—These are as important to a success with the pear as the apple orchard, and should be constructed of low-growing trees, on the south, west and north sides. A single row, with the trees six feet apart, is sufficient, excepting for exposed localities on open prairies, when there should be two rows six feet apart, and the trees in one row alternating with those of the other. As the pear is seldom planted in large numbers in Kansas, in the absence of other shelter it will be found convenient and advantageous to set them alternately in rows of an apple or peach orchard, running north and south. This method will secure both shelter and a partial shade from the noonday sun, which is to some extent the inducing agent to the development of "blight."

CHAPTER 2.

SECTION 1. *Preparation of the Land before Planting*.—All land designed for pear trees, either "standard" or "dwarf," should be well tilled and the subsoil well stirred. The system practiced in the most successful pear-growing regions of the United

States, is trenching. But the average planter would prefer to do without pears rather than to adopt such an expensive method. Therefore, as a substitute which in a measure will help to succeed, the land can be stirred twelve to fifteen inches in depth by running the plow twice in the same furrow, turning the land first from and then twice to the line for the row of trees. This will raise the surface into a ridge on which to plant the trees, and both deep tillage and drainage will thus be secured.

SEC. 2. *Laying Off the Land.*—The system generally employed for an apple or peach orchard is recommended for the pear.

SEC. 3. *Selecting Trees.*—One-year-old trees are preferable, though they cost the price of older ones. They should be stocky and vigorously grown, and well supplied with fibrous roots. The top should be cut back to within one foot of the collar, at the time of planting. This will secure the formation of low heads, which is of more importance with this fruit than any other. When the roots lack fibrous growth, which is quite common with standard trees, lateral roots should be encouraged by the "lipping process," which is performed with a sharp knife, by cutting through the bark into the wood at intervals along the naked roots, upward. A callous will soon form at such points, and vigorous roots will push out.

SEC. 4. *Planting.*—The methods employed in planting an apple or peach are equally safe with a pear tree, with one exception, viz.: Pear trees should, under no circumstances, be set in the fall, as such seldom survive the ordeal of a Kansas winter.

SEC. 5. *Distance.*—"Standards" should be set fifteen feet and "dwarfs" ten feet apart each way. If both classes are used on the same piece of land, set the "standards" twenty feet apart in the row, and rows fifteen feet apart, and alternate with "dwarfs" in the row. But after twenty-five years of successful culture in Kansas, it is recommended to use only the dwarf class of all varieties, excepting the Bartlett and Seckel, and adopt the process of converting them into what is known as the half-standard tree. This is done by setting the tree deep enough to bring the pear stock under the ground, from which pear roots will strike. In this, we obtain the early and abundant fruiting of the "dwarf," and increase the longevity of the tree.

SEC. 6. *Cultivation.*—Pear trees should have the same care in culture as an apple tree; and as soon as they begin to fruit the land should be seeded to red clover. This should be cut each season and thrown around the trees for a mulch. Whenever they lack a proper vigor in growth, apply to each tree from one-half to a bushel of well-rotted stable manure every third or fourth year in the fall or winter, or an annual dressing of the land around each tree of one-fourth a bushel of unleached wood ashes. This treatment has not been recommended by the Society, but from the results of experience in some localities it is evident that more pear trees have failed from a stunt produced by starvation than from all other causes.

SEC. 7. *Pruning.*—Pear trees should have only such pruning as is needed to produce symmetrically-formed heads, and still sufficiently dense to shade the trunk and branches at all times. The "shortening-in" system should be applied the latter part of June each year, and the terminal growth of all central shoots "pinched off," for the purpose of checking and hardening the wood, and all interlocking and crowding growth removed from the center of the head.

CHAPTER 3.—RELATING TO THE FRUIT.

SECTION 1. *Necessary Tools—Ladders.*—The common folding step-ladder is the most useful form for gathering the fruit.

SEC. 2. *Baskets.*—The splint half-bushel basket, with an adjustable bail, is one of the best for picking.

SEC. 3. *Crates*.—The one-third-bushel size commonly used for shipping peaches is well suited for shipping the pear. They are cheap, and easily handled.

SEC. 4. *Time to Gather*.—To determine the best condition of the fruit for picking is quite difficult to explain. Such knowledge must largely come from experience. The size and color are no reliable index as a rule, as some sorts are always green-looking upon the tree, while others put on a beautiful red cheek long before ripe. The practice adopted with some growers is to gather as soon as the seeds are brown; with some varieties one-half of their richness will be lost by so doing. Other varieties *require* picking while they appear to be green, and even unripe, to secure their highest quality and to prevent a rotting at the core. The appearance at the proper time is peculiar to each sort, and cannot be described understandingly. It is safe, however, to gather the fruit whenever the stem will separate readily from the branch by turning it out of a natural position. It is then in best condition for gathering, and has attained its highest excellence.

SEC. 5. *Picking*.—The fruit should be gathered carefully, avoiding chafing or breaking of the skin, and placed (not dropped) in small baskets lined with paper. Care should be given to preserve the stems whole, especially of all such as are intended for market.

SEC. 6. *Sorting*.—The baskets containing the fruit are taken from the orchard to a sorting-room, and there graded into first and second class, and culls, according to size, appearance, and soundness, and if intended for shipping, packed at once into crates, branded with grade and the name of grower, and sent to destination before the fruit has become the least mellowed. If for home market, shelves not over three feet wide and four inches deep, lined with soft paper, are preferable. In these place the fruit, not more than two layers deep, and cover with paper. Darken the room, and close it against any sudden changes in temperature. They should be examined every few days, and all such as begin to show a yellow color sorted out, packed in 9-lb. grape baskets lined with merchants' tissue paper, covered with same, and sent to market. Such small packages, neatly put up, sell readily for family dessert purposes, at high prices. The culls can be disposed of for canning or preserves. As not all of the crop, even of the same variety, will become fit for picking at once, the trees must be run over several times before the entire crop is gathered. This is an advantage to the grower, as it will enable him to handle the crop without loss if carefully managed, as well as to take advantage of the market. Winter varieties should remain on the trees until in danger of frosts, then gathered, and all sound fruit carefully packed in close shallow boxes, lined with soft paper, and placed in a cool, darkened room, safe from freezing. They should be examined occasionally, and softening specimens carefully removed, but not otherwise disturbed until the time for marketing; then brought into a moderately warm room, care being taken to keep them closely guarded from exposure to light and air, or they will soon wilt, and never properly color or mellow.

SEC. 7. *Fruit-Room*.—Such an apartment is an indispensable requisite in handling a crop of pears, and such a convenience should be provided for every farm where fruit is grown even in quantity only for family use. It should be constructed with adjustable shelves, and tables properly arranged for the various fruits of the season, and to avoid any taint from impure air or decaying fruit, and that it may be darkened when not occupied. Absolute neatness should be maintained at all times; to preserve the delicious qualities and the delicate aroma peculiar to many sorts of fruit, which gives to them that delicate flavor so gratifying to the taste.

CHAPTER 4.

SECTION 1. Diseases.—"Blight" is the only disease which is fatal to the tree—in fact, is the main hindrance to success, and the cause of failure. As to its cause, the opinions of the ablest men have differed, but recent investigations by most skillful observers, aided by powerful microscopes, have led to the belief that a species of parasitic plants—a low order of vegetable organism—is the direct agency. But what are the conditions congenial to its development and continued action, is not fully established; nor have any reliable specific remedies or means of prevention been discovered.

SEC. 2. Insects.—The pear tree has no seriously injurious enemies among the insect tribe. A few of the defoliators, as the fall web-worm and handmaid moth, attack it. Its fruit, however, is subject to the depredations of the codling moth, apple curculio, plum curculio, and tree cricket. The ravages of the last-named are most seriously damaging, attacking and destroying the finest specimens to such an extent in some orchards as to reduce the marketable product materially.

THE PLUM AND APRICOT.

These desirable fruits have not been extensively planted in the State, because of the damaging attacks of the curculio (worm on the fruit), yet some facts have been gathered from observation and the experience of planters which encourage the hope that reasonable success may attend future efforts in their culture. Two classes have been used, viz.: those of a foreign origin and their offspring, and those of native origin, which differ much in their characters.

The trees of the foreign class are not so hardy, productive or long-lived as our natives, and while the fruit is vastly superior, their planting cannot be advised for extensive orchards.

There are some of the native class which are quite successful, and of which it is quite safe to plant. The trees are hardy, and produce crops of good fruit, which is less injured by the curculio.

CHAPTER 1.

SECTION 1. Site.—The best is a location where fowls frequent the most, as they are a great help in the work of destroying insects, and especially the curculio, which passes from the fallen fruit into the ground.

SEC. 2. Elevation.—This is not an important point in the culture of the plum, only as it often furnishes the most desirable soil, which is more generally found on high prairie land.

SEC. 3. Slope.—No material advantage is found in different slopes.

SEC. 4. Soil.—The foreign class requires a rich, moist soil, underlaid with a stiff clay, which is found more generally on our uplands. The native class thrives best on a sandy surface and subsoil, most largely found on bottom land, and such locations generally produce abundant crops.

SEC. 5. Drainage.—Good drainage of the surface and subsoil is desirable, and may produce a success on our uplands equal to that of the bottoms.

SEC. 6. Wind-breaks.—These fruits are generally planted near or among other trees, and in such locations need no wind-breaks. In open grounds it is as essential as for other fruits.

CHAPTER 2.

SECTION 1. *Time for Planting.*—Spring is undoubtedly the best time, and those planters who live within a reasonable distance of a reliable nursery had better obtain the trees in the spring, as there is too much loss in most cases in “heeling in” such as are procured in the autumn.

SEC. 2. *Distance to Plant.*—The plum tree does best where closely planted—12 to 15 feet is recommended. It is claimed by some, and evidently sustained by observation, that different varieties should be planted in nearness to each other, as those naturally weak in the fertilizing element will be benefited by the stronger ones.

SEC. 3. *Preparation and Laying-off of the Ground.*—This should be the same as recommended for the apple, peach, pear, and cherry.

SEC. 4. *Selecting Trees.*—In all cases these fruits thrive best when worked on their own roots. The native sorts *may* be used when worked on the peach root, but should be set deep to secure rooting from the graft. But it is safer to use them worked on their own roots.

SEC. 5. *Planting.*—The recommendations given for other orchard trees are safe to follow with these fruits, excepting in “puddling” the roots, which should never be dipped in a clay mud, but simply wet with water.

SEC. 6. *Mulching.*—This is generally to be recommended, using any old hay or straw.

SEC. 7. *Cultivation.*—Cultivate until the tree attains a bearing size, after which it is more productive if let alone. Late fall and early spring culture might aid in the destruction of the curculio.

CHAPTER 3.

GATHERING AND MARKETING THE FRUIT.

SECTION 1. *Picking.*—Pick before fully ripe, and as they ripen unevenly, the trees will have to be run over several times.

SEC. 2. *Packing.*—Pack in small grape baskets; are more suitable than peach boxes.

SEC. 3. *Marketing.*—There has always been a home market for all grown in Kansas. Should be handled same as peaches and cherries.

SEC. 4. *Recommended Varieties.*—(See Voted Fruit List, in this volume.)

SMALL FRUITS.

THE BLACKBERRY.

This delicious fruit is highly prized by the people, in all sections of the State where grown, being about the last to ripen in the small-fruit season. It is a native of our forest lands, and its twin sister, the dewberry, thrives in some sections along the heads and skirts of ravines. A few varieties are successfully and profitably grown in nearly every county in Kansas, where it has been planted and given ordinary culture.

CHAPTER 1.

SECTION 1. *Site.*—This fruit thrives quite well on any location not liable to be visited with late frost in spring-time.

SEC. 2. *Elevation*.—A comparative elevation is as important as with all other classes, and for the reasons heretofore given.

SEC. 3. *Slope*.—Avoid a southwestern slope, or exposure. Any other is preferred.

SEC. 4. *Soil*.—A light, warm soil, having a porous clay subsoil (red or yellow preferred), is best suited to its culture.

SEC. 5. *Drainage*, either natural or artificial, is essential to success.

SEC. 6. *Wind-breaks*.—These are valuable when constructed on the south and southwest, as a protection during the growing and fruiting season.

CHAPTER 2.

SECTION 1. *Time for Planting*.—The best results have followed planting in the spring.

SEC. 2. *Distance Apart*.—Most experienced growers prefer the rows to be eight feet apart, and plants two and a half feet in the row, for the large-growing varieties. For those of a dwarf habit, the rows may be only six feet apart.

SEC. 3. *Preparing and Laying Off the Ground*.—Plow as deeply as practicable, and if the subsoil is not naturally porous, follow with a subsoil plow, late in the fall, and the following spring harrow it well and level down with a platform drag. Stake off places for the rows, and along these open deep furrows with a two-horse plow, if strong-rooted plants are to be used; but if root-cuttings, then with a one-horse plow.

SEC. 4. *Selecting Plants*.—Strong-grown and well-rooted suckers are the best. These may be dug in the fall and "heeled in" during the winter, or taken from an old plantation in early spring and set out at once. In either practice care should be given to protect their roots from drying winds and the sun. Root-cutting should be made in the fall—using none less than a quarter of an inch in diameter, and from four to six inches in length, and packed in moist soil or sand, and stored in a cool damp cellar. In early spring set them in the permanent plantation, or in nursery rows. Cultivate one season, and the following spring transplant into rows the same as recommended for rooted plants.

SEC. 5. *Planting*.—The rules given for setting red raspberry plants may be safely followed with this class. (See chap. 4, sec. 5.) Dewberry plants, the same as blackcap raspberry. (See chap. 2, sec. 5.)

SEC. 6. *Cultivation*.—This work may be given similar to the recommendations for raspberry plantations. During the first year garden vegetables may be grown between the rows, or even a plantation of strawberries may be profitably grown without injury to the plants.

SEC. 7. *Pruning*.—It is not best to summer trim the plants the first season after planted, but "shorten in" their tips the following spring, and each year thereafter. As soon as the new canes reach a height of one and a half or two feet "pinch off" the ends, which will encourage lateral growth and strengthen the main stems. Each spring the laterals should be shortened to within a foot of the stem. There is an advantage in not removing the old and dead canes until winter is past, as they will collect the snows and afford shelter to stalk and roots during cold weather. Only four to six canes should be allowed to form from any one plant in any season.

SEC. 8. *Gathering and Marketing the Fruit*.—About the same methods recommended for the strawberry should be adopted in the handling of this fruit. (See chap. 2, secs. 1-7.) Like all soft fruits, it should never be handled when wet, or after picked be exposed to the sun or winds.

SEC. 9. *Recommended List of Varieties*.—(See Voted Fruit List, in this volume.) For the southern tier of counties the Kittatinny and Lawton generally succeed, but

have proven too tender generally in the Northern and Central Districts; while the Snyder and Taylor have not been injured seriously by either in any large portion of the State.

THE CURRANT.

This healthful fruit has been annually increasing in successful culture, until at the present time its culture can be safely undertaken in a large portion of the State. From the time at which the plant enters its dormant state (which is generally by the middle of August) until it commences its growth the following spring, is the period of its trials, owing to the debilitating effect of extremely hot and dry weather commonly occurring during the after part of the summer, and which is followed by the extreme cold of winter.

CHAPTER 1.

SECTION 1. *Location.*—The borders and corners of a garden, or any place which will afford shade and shelter from the midday sun and hot winds, is preferred, and will furnish the best results, but in some portions of the State it has become successful even in open-field culture.

SEC. 2. *Elevation and Slope.*—Neither of these requires attention in its culture.

SEC. 3. *Soil.*—A clay loam that retains moisture and coolness is preferred. Light sandy or friable soils are not desirable.

SEC. 4. *Drainage.*—Such as will prevent a stagnant condition during heavy rain-falls, is essential.

SEC. 5. *Wind-breaks.*—Shelters which will protect the plants from hot south winds should be constructed. These may be made of low-growing trees, or even a common board fence or stone wall on the south will form all needed shelter for several rows which run east and west.

CHAPTER 2.

SECTION 1. *Time for Planting.*—It can be safely done in autumn, and the sooner after the leaves have dropped the better. If deferred until spring it should be done as soon as the frost leaves the ground and a proper preparation can be secured.

SEC. 2. *Preparation of the Land.*—It should be deeply stirred and thoroughly pulverized, and made rich with well-rotted manure.

SEC. 3. *Selecting Plants.*—Strong, healthy and well-rooted one-year-old plants are preferable.

SEC. 4. *Distance to Plant.*—Set in rows five feet apart and three feet in the row.

SEC. 5. *Planting.*—Before setting, the long, straggling roots should be "shortened in," and bruised portions cut off, and remaining ones dipped into a thin mud. The top should be reduced by cutting back all of the last year's growth to within four or five inches of the crown. Set in holes or in a furrow, sufficiently deep and large to admit of the roots spread out in natural position. Fill in with surface soil, working it well in among the roots with the hand, then close up around the plant so that when the earth is firmly settled the roots will be well covered. As with plants of all classes, their roots should be kept moist and protected from the time they are taken from the ground until reset.

SEC. 6. *Cultivation.*—The land should be kept in good tilth at all times during the growing season, and especially during the latter part of summer, unless mulching is used, which performs a good service in keeping the ground cool and moist

through the heated season. These conditions secure a *strong, healthy fruit bud* for the next year's crop, to which its *abundance*, full clusters, and *excellent* character are *largely* indebted.

CHAPTER 8.

HANDLING AND MARKETING THE FRUIT.

SECTION 1. *Picking*.—The recommendations given for the strawberry are to be observed in reference to this fruit. It must be picked by the stem, and not stripped off, and all defective and unripe berries removed from the clusters. When the box is being filled, a few gentle raps should be given to settle the clusters into place. All the conveniences and same character of boxes and crates used in the handling of other small fruits are equally adapted to this.

THE GOOSEBERRY.

The past few years have demonstrated the gooseberry to be among the valuable small fruits. Its easy cultivation and propagation, usefulness, and hardness of the plant, together with its early bearing and good shipping qualities, make it especially desirable to every Kansas home and among market gardeners. This fruit, unlike most others, is valuable as soon as the berries are well formed. It is ready for the table in pies, tarts and puddings earlier than any other fruit. There are however but few varieties that can be recommended as possessing high excellence.

CHAPTER 1.

SECTION 1. *Propagation*.—Gooseberry plants should be grown only from cuttings. In preparing cuttings, select only the straight, young canes of the current year's growth. These should be ten or twelve inches in length, and should be made during the winter, when the wood is not frozen.

SEC. 2. *Location*.—Almost any location is suitable for this fruit. While shade seems beneficial in many locations, the best results are obtained from open grounds.

SEC. 3. *Soils*.—A clay loam is preferred, for the reason that it retains moisture best. Avoid, however, wet, soggy land; such can be used if well drained.

SEC. 4. *Preparation of the Land*.—Such as is required to yield good field crops, will be suitable for this fruit.

SEC. 5. *Time for Planting*.—As the plant starts very early in the spring, it is advisable to plant in the fall, or as soon in the spring as the frost leaves the ground.

SEC. 6. *Distance Apart*.—As this fruit requires thorough cultivation, it should be set in rows five feet apart and four feet in the row.

SEC. 7. *Planting*.—The recommendations given for planting the currant or blackberry, apply equally to the gooseberry.

SEC. 8. *Cultivation*.—The recommendations given for other small fruits in this manual, apply equally to this fruit.

SEC. 9. *Handling and Marketing*.—Owing to the exceeding firmness of this fruit, its handling and marketing are more easily conducted than any other of the small fruits. It can be gathered at times when other classes cannot, viz., in the early morning when yet covered with dew, or immediately after showers, as it readily dries out, and can be marketed the next or several days thereafter without injury or loss. Care should be given at all times to exclude all leaves and damaged berries in its picking. It can be shipped a longer distance than any other of the small fruits. It can be shipped in packages similar to other small fruits, or in bulk in baskets.

SEC. 10. *Recommended List*.—(See Voted Fruit List, in this volume.)

THE RASPBERRY.

This class appears to stand second to the strawberry in the list of small fruits, in a succession, the season of the early varieties beginning just when that of the strawberry ends. It also appears to be rated second in commercial importance. But considering its superiority for canning and evaporating, which makes it a standard article in this condition in our markets, there may be some doubts as to its being second to any of the berries known to horticulture.

The classes—Blackcap and Red—differing in many features, and requiring different treatment in their culture, will be considered separately.

THE BLACKCAP.—CHAPTER 1.

SECTION 1. *Selecting a Site.*—Never select a comparatively low piece of land for the raspberry, or where there will be a stagnation of air.

SEC. 2. *Elevation.*—The high lands of Kansas prairies are well adapted to raspberry culture, and are preferable to low bottom lands.

SEC. 3. *Slopes.*—Lands sloping to the north or northeast afford the most satisfactory results. Plants on southern slopes are liable to injury from the winter suns.

SEC. 4. *Soil.*—Naturally, the plant thrives best in a deep, warm soil. Cleared brush or timber lands, abounding with leaf-mold, and having a red-clay porous subsoil, are preferred; but quite successful results can be obtained on much of the rolling prairies in the State, having a porous subsoil.

SEC. 5. *Drainage*, either natural or artificial, is essential. The plants will not thrive in places where water remains any length of time about their roots.

SEC. 6. *Wind-breaks.*—Shelters on the north and south sides are valuable. Orchards often afford the necessary protection, and while young, the spaces between rows may be profitably planted to raspberry plants. The culture required is not only beneficial to the plants, but also to the orchard trees. In such locations the yield is far greater than in an open, exposed field.

CHAPTER 2.

SECTION 1. *Time for Planting.*—Spring-time is generally conceded to be preferable; but such work may be done quite successfully in late autumn, if the directions following are strictly adhered to.

SEC. 2. *Preparing and Laying Off the Ground.*—The land should receive a deep plowing in the fall, and be thoroughly harrowed in early spring, as soon as frost leaves and the land becomes sufficiently dry to work. When this has been done, establish a line of stakes as guides for the row, and with a team and plow open up a deep furrow along the line.

SEC. 3. *Distance Apart.*—The rows should be seven feet, and plants in the rows two and a half feet apart.

SEC. 4. *Selecting Plants.*—Good plants should have a large supply of fibrous roots. These should be of a light color, nearly white, to be in a healthy state. If dark brown, they have been injured, and plants having such roots should be rejected. The same advice heretofore given should be strictly heeded in buying raspberry plants, viz.: Obtain them from a reliable grower, as near by as practicable. But if necessary to ship them from abroad, as soon as received take them from the box, dampen their roots, and "heel in" until planting-time.

SEC. 5. *Planting.*—Having the plant-roots well moistened, and straggling ones "shortened in," place as many in a basket as can be conveniently carried in one

hand, and drop one plant in the furrow a short step apart. Have another man follow the dropper and cover them with a hoe until the furrow is nearly filled up with loose, moist earth, being careful not to pack it down over the plant, so that the tender shoot will not be hindered in easily pushing through to the surface.

SEC. 6. *Cultivation*.—This should be simply clean culture till about the first of August, and no later, or a late growth will be induced, which is not desirable. Between the rows may be grown crops of early potatoes, peas or beans. In all cultivation, work the earth up to the rows, to give depth of soil around the plants. Each year after the first, cultivation should begin in the spring and be kept up until picking-time, and, as soon as the fruit is gathered, be continued as advised for the first year.

SEC. 7. *Pruning*.—A heavy pair of buckskin gloves and a pair of pruning-shears are the only implements needed after the first year. During the second year, the previous year's growth should be cut back—the central growth to about eighteen inches high, and the laterals to within six inches of the stock. When the new canes have grown eighteen inches in height, pinch off the end to cause it to throw out laterals.

SEC. 8. *Mulching*, as a protection, is injurious, as it has the tendency to induce the roots to form too near the surface of the ground. It should only be applied as a fertilizer, and then in a rotted state, and worked into the ground while cultivating.

SEC. 9. *Gathering and Marketing*.—The recommendations given under the head of "Strawberry Culture," chapter 3, sections 1-7, are to be regarded as applicable to raspberry culture, and need no repetition under this head.

RED VARIETIES.—CHAPTER 3.

SECTION 1. *Sites*.—High prairie and timbered hills have so far produced the best results.

SEC. 2. *Soils*.—Light, porous, sandy and well-drained soils are preferable.

SEC. 3. *Drainage*.—The recommendations for the Blackcap class are applicable to this class. (See ch. 1, sec. 5.) Quite heavy soil can be made suitable for this class by giving it a proper drainage.

SEC. 4. *Wind-breaks*.—This class is not so much benefited by such protection as other fruits. Their natural habit of growth enables them to better resist the force of winds; yet there are some varieties that require their help, and, as a whole, their culture is aided by them.

CHAPTER 4.

SECTION 1. *Time for Planting*.—If the land selected for this class is inclined to heave by freezing, the spring is decidedly preferable. On other lands planting may be successfully done in autumn.

SEC. 2. *Preparing and Laying off the Ground*.—For this class follow the directions given for Blackcaps. (See ch. 2, sec. 2.)

SEC. 3. *Distance Apart*.—The rows should be from six to seven feet apart, and plants about three feet apart in the rows. Some varieties may require greater distances, which the planter should judge and regulate accordingly.

SEC. 4. *Selecting Plants*.—It is very important that they be healthy and vigorous, not that they must be large plants. Suckers not over eighteen inches high, if stocky grown, will make large and well-developed plants when transplanted.

SEC. 5. *Planting*.—When the land is in good working condition, take the plants from the "heeling-in" trenches, or from a plantation, dip their roots in a thin mud, and set in furrows as recommended for Blackcaps (see ch. 2, sec. 2,) in the following

manner, viz.: One man with a bundle of plants places one in an upright position in the furrow every two or three feet apart, holding it in place while with his foot he draws around it sufficient earth to cover the roots, and then firmly tramps it down. This will hold it in position until another man following fills up around the plant until the furrow is full. As soon as the planting is completed, with a plow turn the ground to the row, completely filling the furrow opened for the plants.

SEC. 6. *Cultivation*.—As much of the success depends on the first year's growth, it should be cultivated thoroughly from early spring until the 1st of August, unless the land continues weedy, when it may be fallowed later, but quite shallow, and largely with a hoe.

SEC. 7. *Pruning*.—This with the red class should be done only in the spring, and about the time buds begin to start, by "cutting back" the canes to within two feet of the ground, and removing all damaged and dead wood.

SEC. 8. *Second Year's Culture*.—Cultivation should commence early, and cease when the fruit begins to ripen. In the management of the plantation, the hill system has proven the most satisfactory. This consists in keeping all sucker growth cut down, and permitting about four or five strong canes to form about the parent plant.

CHAPTER 5.

SECTION 1. *Picking and Marketing*.—The same rules given for strawberry culture will be applicable to the Red class. (See ch. 3, sec. 1-7.)

SEC. 2. *Recommended List of Varieties*.—(See Voted Fruit List, in this volume.)

THE STRAWBERRY.

This class of fruit is a success over a large portion of the State. Its easy culture, productive habits, and the delicious character of its fruit, have combined to make it desirable and popular wherever grown.

CHAPTER 1.

SECTION 1. *Selecting a Site*.—If the plantation is intended only for family uses, select a place near the dwelling, and where it can be protected from the depredations of poultry. But for commercial purposes it should be beyond their range, and, when practicable, within plain view of the dwelling, that it may be guarded from the intrusion of depredators.

SEC. 2. *Elevation*.—The most successful is land having a comparative elevation, that is, elevated above the general surrounding land. This may be found even on a general bottom land, and is desirable because of its greater liability to exemption from late spring frosts, and the better air-circulation existing at such locations.

SEC. 3. *Slope*.—For an early-ripening product of fruit, a southern slope is best, but a northern slope is safest for the main crop, as the plants are retarded in the development of the fruit buds, and will generally escape the damage of a late frost.

SEC. 4. *Soil*.—Brush or timber land, when cleared and properly prepared, will afford the best results; yet a deep clayey loam will produce a vigorous plant and abundant crops, and is preferred whenever the first-named is not obtainable. Avoid alkaline land, and also thin upland sandy land, unless where underlaid with a tenacious subsoil.

SEC. 5. *Drainage*.—Strawberry plantations must have sufficient either natural or artificial drainage to prevent saturation or a stagnant condition of the rainfalls.

SEC. 6. *Wind-breaks* are essential to prevent too rapid evaporation of moisture in March and April, from newly-set plantations, and the blowing of the winter mulching from the old ones.

CHAPTER 2.

SECTION 1. *Time for Planting*.—Experience has settled upon spring as the best time, and as early as the land can be suitably prepared. Planting may be done the last of August and fore part of September, when circumstances unavoidably have prevented it in early spring, but never with the best results.

SEC. 2. *Distance Apart*.—This is governed somewhat by the character of the varieties used. But for a mixed lot and field culture, three and a half to four feet is best for the rows, and from one to one and a half feet in the row. In garden culture, plant two rows fifteen inches apart, and the plants one foot in the row. Then leave a space two and a half feet in width, and plant two more rows in same form as the first; and continue in this form until the land is filled out.

SEC. 3. *Preparing the Ground*.—Thoroughly and deeply plow the land, in autumn if practicable. If not, then as early in spring as condition will permit, and harrow until well pulverized.

SEC. 4. *Laying off the Ground*.—There are two modes for doing this. First, attach two buggy wheels to an axle having the desired length to give the distance determined upon for the rows apart. Stake off the first row, and pull or push the wheels over the land, following the line of stakes. The wheel-tracks will be the line to plant. Then measure from the inside wheel-track one and one-half the length of the axle onto the unmarked land, and there set stakes for guides to another crossing with the wheels, which will make marks for two more rows of plants. Follow in this way over all the land to be planted. Second, in the absence of wheels, use a strip of common fence plank of the length of seven feet, if the rows are to be three and a half feet apart, and eight feet if to be four feet apart. On its ends and at the middle fasten pieces of boards for markers; attach a tongue, and proceed in same manner as directed with the wheels.

SEC. 5. *Selecting Plants*.—Strong, vigorous one-year-old plants should always be used, (older ones are not worth planting,) and obtained of the nearest reliable grower. Their roots should be packed in some dampened material as fast as taken from the ground, and kept so until either "heeled in" or planted in the row. Plants shipped in are never as good as home-grown ones.

SEC. 6. *Planting*.—A man with a spade beginning at the end of a mark where the row is to be planted, places the middle of the spade on the mark, and crossways of the row, thrusts it into the ground at an easy angle to a sufficient depth to receive the roots of the plant in a natural position, shoves the handle forward to an upright position, and at the same time another grasping a plant well down onto the crown, with the thumb and forefinger, places the same into the opening and under the spade sufficiently deep to have its crown a little under the ground when let back by lifting out the spade, and gently pressed down with the foot as the spader passes to the next place for a plant. Two men should in this way plant from 2,500 to 3,000 plants in a day. Care should be taken not to form too great a depression around plants, as heavy rains will wash in the dirt, covering the crown so deep that it will rot before the start gets above ground, unless the weather is quite warm.

SEC. 7. *Cultivation*.—This work should be commenced shortly after the planting is finished, and continued constantly through the season until autumn frost occurs. At first run a cultivator between the rows, gauged so as to turn the ground to the plants, avoiding covering them, and the forming a trench which would retain rain-

falls around the plants. Then follow with hoe to level down any ridges which may occur, and clear out all weeds. In some kinds of heavy clay soils it sometimes becomes necessary to run a one-horse turning-plow with the bar side well up to the row, and in a few days work the dirt back to the row with a cultivator. As a strong plant-growth is the one important end to be gained, it is folly to permit the newly-set plants to develop blossoms and fruit the first year; therefore all such growths should be promptly "pinched off" as soon as they appear. All runners should be promptly removed until the plant becomes well established; then, if to be grown under the matted-row system, the runners should be turned into the space between the hills, and then into the space between the rows. During the after-season, in cultivating, fasten to the front of the cultivator a cross-bar on each end of which is attached a rolling coulter, gauged at such distance apart as the width of the space between the matted rows is required for culture. This implement will remove all plants from the space. Matted rows have generally the preference to any other system of growing the strawberry; the main reason being that the prevalence of root-destroying insects would not be so disastrous as in the single-hill system.

SEC. 8. *Winter Protection.*—Every plantation should have a protection during the winter months, and in a bearing season, until the crop of fruit is gathered. Old prairie hay is the best, being freer from weed seeds and other foul matter than most any other substance. This should be placed on the rows in autumn or early winter, as the ground becomes frozen, to prevent injury occurring from heaving of the land by freezing, and the exposure of the roots to sun and wind; also during the fruiting season, to retain moisture.

CHAPTER 3.

GATHERING AND MARKETING THE FRUIT.

[NOTE.—On the methods adopted for the picking and disposing of the crop, depends the success or failure of the profits of a plantation.]

SECTION 1. *Picking-Stands.*—These should be provided beforehand, and made a suitable size to hold six quart boxes by using four corner posts four to six inches long, and one to one and one-half inches square. The sides, ends and bottom should be covered with common lath, cut into proper length, put on with fine shingle or common lath nails, leaving spaces between each of one to two inches wide, to the ends of which attach a bail or handle of some tough wood.

SEC. 2. *Boxes.*—For large plantations the material should be secured in autumn, and made up during the winter. There are two styles—the "Leslie Oblong Octagon," and the "Halleck," which is square. Either should be yellow-poplar wood. The first is the more generally used.

SEC. 3. *Crates.*—The material for these should be procured early in the season, and made up. The size holding twenty-four boxes is most suitable for all purposes, and should be of yellow-poplar wood.

SEC. 4. *Packing-House.*—Every plantation of half an acre or more should be provided with ample shelter and storage room for the fruit during the picking season. If simply for shelter from sun and winds, it may be constructed of common canvas cloth stretched on a pole frame; but if for shelter from rains, then it should be constructed of lumber. In either structure shelves should be provided within, on which to place the boxes when brought from the plantation before packed.

SEC. 5. *Picking.*—For shipping, the fruit should be gathered as soon as fairly colored. For home market, where it will be used in a short time, it should be allowed to remain until fully ripened, to attain its highest excellence. For either purpose, care must be given to pick by the stem, a short portion of which should be left attached to the fruit. It is best not to touch the fruit in picking, as any loosening of

the stem, or pressure causing the juices to flow, will prove an injury, and often spoil a large portion of the box. None but sound and well-formed berries of standard size should be placed in the boxes, either for a first or second class—the grading being made as to size only. Plantations should be carefully picked over each day, to prevent any fruit becoming over-ripe.

Sec. 6. Packing.—Each box should be slightly over-full, and their tops faced by turning the stem end of the berry down, to give an attractive appearance to the whole, and placed in close-fitting crates, closed up, marked with name of variety and grower, and put on its route to its destination at once.

Sec. 7. Marketing.—All soft classes of fruit should be hauled to market in spring wagons, and even then care should be given, in driving over rough roads, to avoid all shaking and jostling as much as possible. Gentle driving will pay.

CHAPTER 4.

SECTION 1. Recommended Varieties.—(See voted Fruit List, in this volume.) For a home or near market, preferred in the order named: Crescent, Windsor Chief, Miner's Prolific, Glendale.

Sec. 2. Renewing or Continuing a Plantation.—Some very successful growers adopt the plan of plowing under all plants after they have yielded a crop of fruit, holding that a second-year's crop is not profitable, and further, that should there be a prevalence of insects noxious to the leaves and roots—as the leaf-roller, white grub, and crown-borer—such treatment will cause their extermination. Others continue their plantations through two or more years. This method requires breaking up the land, and leaving about one-foot strips of plants, which answer for rows, at proper distances apart throughout the plantation, and cultivating the spaces between as in a new plantation.

VOTED FRUIT LIST FOR KANSAS, (CONDENSED.)*

BEING THE RECOMMENDATIONS OF THE COMMITTEES PREPARING THE MANUAL.

The following list is calculated for a family orchard, and the varieties are arranged in the order of preference:

APPLES.

Summer.—Early Harvest, Carolina June, Sops of Wine, Cooper's Early (White), Early Pennock.

Autumn.—Maiden's Blush, Chenango, Lowell, Jonathan, Wine (Pennsylvania Redstreak).

Winter.—Winesap, Ben Davis, Missouri Pippin, Jonathan, Broadwell (Sweet), Rawle's Genet, Rome Beauty, White Winter Pearmain, Smith's Cider, Grimes's Golden.

Crab Apples.—Transcendent, Hyslop, Whitney's No. 20.

APRICOTS.

Moorpark, Breda, Early Golden, Russian.

CHERRIES.

Early.—Early Richmond, May Duke, Governor Wood, Leib, Montmorency.

Late.—English Morello, Common Morello, Belle Magnifique, Ostheim, Late Richmond.

* NOTE.—The Voted Fruit List, as prepared by the Society, will be found at the close of this volume.

PEACHES.

Early.—Amsden, Alexander, Hale's, Rivers, Louise, Large Early York, Crawford's Early, Wyandotte Chief, Troth's Early.

Medium.—Stump the World, Old Mixon Free, Old Mixon Cling, George IV, Smock, Morris White.

Late.—Heath Cling, Crawford's Late, Salway, Ward's Late, Stump the World.

PEARS.

NORTHERN DISTRICT.—*Early*: Summer Doyenne (Doyenne d'Été), Osband's Summer, Bartlett, Clapp's Favorite, Flemish Beauty. *Medium*: Bartlett, Howell, Sheldon, Seckel, Angouleme (Duchesse). *Late*: Seckel, Angouleme, Lawrence, Winter Nelis, Vicar.

CENTRAL DISTRICT.—*Early*: Early Harvest, Summer Doyenne, Rosteizer, Osband's Summer, Clapp's Favorite. *Medium*: Bartlett, Flemish Beauty, Howell, Louise Bonne de Jersey, Kieffer. *Late*: Seckel, Lawrence, Easter Beurre, Winter Nelis, Vicar.

SOUTHERN DISTRICT.—*Early*: Early Harvest, Summer Doyenne, Madeleine, Osband's Summer, Seedless. *Medium*: Bartlett, Clapp's Favorite, Flemish Beauty, Howell, Louise Bonne de Jersey. *Late*: Sheldon, Angouleme, Lawrence, Winter Nelis, Vicar.

PLUMS.

Wild Goose, Miner, Weaver.

For Trial.—Mariana, Bassett, Yellow Chickasaw.

GRAPES.

Early.—Hartford, Moore's Early, Champion, Early Victor.

Medium.—Concord, Delaware, Pocklington, Martha.

Late.—Catawba, Goethe, Dracut Amber, Ives, Clinton.

BLACKBERRIES.

Early.—Kittatinny, Early Harvest, Taylor, Early Cluster.

Late.—Snyder, Lawton, Kittatinny, Stone's Hardy.

CURRANTS.

Red Dutch, Cherry, White Grape, White Dutch.

RASPBERRIES—BLACKCAPS.

Early.—Souhegan, Hopkins, Tyler, Davison's.

Medium.—McCormick, Smith, Ohio.

Late.—Gregg.

RED VARIETIES.

Shaffer, Cuthbert, Reliance, Turner, Thwack.

GOOSEBERRIES.

Houghton, Downing, Smith, Pale Red.

STRAWBERRIES.

For a home or near market.—Crescent, Windsor Chief, Miner's Prolific, Glendale.

REPORTS OF STANDING COMMITTEES.

NOMENCLATURE AND NEW FRUITS.

BY STANDING COMMITTEE, G. C. BRACKETT, LAWRENCE.

NOMENCLATURE.

Your committee has on several occasions pressed upon your attention the importance of a strict adherence at all times to the suggestions of the American Pomological Society, in its work as a national society, for corrections in using improper names to the various classes of fruit in cultivation in the State. The reckless use of synonyms of a variety mislead the planter, if a new beginner, and often even the experienced grower, and it often occurs that we find in the same orchard a variety of fruit growing under two names, from the fact that one bears the proper name, and the other has been purchased under a synonym.

At our fairs this confusion quite often is found, and when an exhibitor is aiming to win an award for the largest collection, he is mortified and disappointed to find that the judges have set aside as synonyms some dozen plates or more of his choicest specimens, and on which he had depended to win the premium. Such recklessness meets with its proper reward often.

A most conspicuous error in this line was found at a county fair in 1885, when the Early Pennock was exhibited in different displays under three different names, and the Vicar (pear) under four. I suggested to the superintendent that a change should be made, and its correct name be placed on each plate, that visitors might learn their true names. He replied, "it would not do; that each exhibitor would contend that his naming was correct." And so the public were left to conclude that there were three varieties of apples and four of pears so nearly alike that a difference was not discernible. Should any one of these three names be used in an order for trees, the purchaser would be put to much trouble in most instances to find what he was hunting for, if at all.

There can be no reliable purchase of any nurseryman, excepting of such as are careful to preserve their varieties true to name, and arrange the lists in their catalogue on a correct nomenclature, and to publish the synonyms of all varieties offered in their catalogue. The nurserymen of our State are largely the educators of the people in this line. As their catalogues are made up, so the people order and buy. The result may be either satisfaction or a disappointment of the severest character. Therefore, the nurseryman who is honestly bent on sustaining the greatest prosperity of the fruit industry, and his own reputation for square, honorable dealing, will post himself thoroughly as to synonyms, which is of as much consequence to his own interest as to any other part of his business. It is important to enable him to understand what a man orders, when, in his ignorance of nomenclature, he orders under a synonym, which his own ignorance fails to properly place, and, in consequence, orders may go from him which he could have retained, as many purchasers

will not permit any substitution. His customer has seen the variety, is pleased with it, and is determined to have it, if it can be found under the name he knows it by.

For the advantage of the readers of this report I will give the Voted Fruit List of this Society, and the synonyms, as far as known, to each variety therein.

APPLES — SUMMER VARIETIES.

Early Harvest.—Synonyms: Prince's Harvest, July Pippin, Early July Pippin, Yellow Harvest, Large White June Eating, Tart Bough, Early French Reinette, Sinclair's Yellow, Maralandica, Oats Apple (by Downing).

Carolina June.—Carolina Red June, Carolina Russet, Carolina Striped June, Caroline, Caroline Watson, Carpenter's No. 1 (by Warder), Carolina Red June, Carolina Redstreak, Carolina Red Stripe, Carolina Spice, Carolina Striped June, Knight's Red June, Red June, Blush June, Georgia June, Wilson's June, Red Harvest, Susy Clark (by Downing).

Red Astrachan.—Deterding's Early, Astrachan Rouge, Vermilion d' Éte, Abe Lincoln (by Downing), Red Bellflower (by Warder).

Cooper's Early White.—Early White Cooper (by Downing).

Oldenburg.—Smith's Beauty of Newark, New Brunswick (by Downing), Duckett (by Warder).

Hightop Sweet.—Hiker's, Hill's Favorite, Hilton, Hinesley, Hoary Morning, Hockett Sweet (by Warder), Summer Sweet, Sweet June, Early Sweet (by Downing).

AUTUMN VARIETIES.

Maiden's Blush.—Vestal (by Downing), Maiden's Favorite, Major, Malamuskeet, Male Carle, Mammoth June, Mammoth Pippin (by Warder).

Rambo.—Rambour Franc (by Warder), Fall Romanite, Gray Romanite, Striped Rambo, Delaware, Romanite, Seek-no-further, Bread and Cheese Apple, Trumpington, Large Rambo, Terry's Redstreak (by Downing).

Lovell.—Pound Royal, Queen Anne, Orange, Michigan Golden, Tallow Apple, Greasy Pippin, Golden Pippin (by Downing), Lucombe's Seedling.

Jonathan.—Julien, July (by Warder), Jones Pippin, Journalaskia, King Philip, Philip Rick (by Downing).

Fameuse.—Pomme de Neige, Sanguineus, Snow Chimney, Snow (by Downing), Chimney (by Warder).

Grimes's Golden.—Grosh, Grosser Erdbeere, Gullett, Gully (by Warder), Grimes's Golden Pippin (by Downing).

Fall Wine.—Sweet Wine, Ohio Wine, Sharpe's Spice, Uncle Sam's Best, Musk Spice, Hower or House (by Downing), Fall Winesap (by Warder).

WINTER VARIETIES.

Winesap.—Winfield (by Warder), Winesop, Potpie Apple, Uxbridge Spice, Holland's Red Winter, Royal Red of Kentucky (by Downing).

Ben Davis.—Robinson's Streak, Hutchinson's Pippin, Joe Allen, Kentucky Red Streak, Tenan Red, New York Pippin, Victoria Pippin, Victoria Red, Red Pippin, Kentucky Pippin, Baltimore Red, Baltimore Pippin, Baltimore Redstreak, Carolina Redstreak, Funkhouser (by Downing), Ben Harris (by Warder).

Missouri Pippin.—Missouri Keeper (by Warder).

Rawle's Genet.—Jefferson Pippin, Missouri Janet, Red Neverfail, Rawle's Jannet, Rawle's Jannetting, Rawle's Janet, Rock Remain, Rock Rimmon, Yellow Janett, Winter Jannetting, Jeniton, Jennett, Neverfail, Indiana Jannetting, Rawle's Gennetting (by Downing).

Willow Twig.—Willow, James River (by Warder).

Smith's Cider.—Smith's, Fuller, Pennsylvania Cider; Fowler, Popular Bluff.

Rome Beauty.—Gillett's Seedling (by Warder).

Gilpin.—Carthouse, Roman Knight, Small Romanite, Romanite of the West, Gray Romanite, Little Romanite (by Downing), Little Red Romanite (by Warder).

Dominie.—English Rambo, Hogan, English Redstreak, Wells, Striped Rhode Island Greening, English Beauty of Pennsylvania, Cheat, Clingtight, American Nonpareil (by Downing).

White Winter Pearmain.—Campbellite (by Downing).

ADDITIONAL LIST OF POPULAR VARIETIES.

Wine.—Hay's Winter, Pennsylvania Redstreak (by Warder), Winter Wine, English Redstreak (by Downing).

Porter.—Jennings, Smokehouse, Millcreek Vandevere, Red Vandevere, English Vandevere (by Downing).

Fallawater.—Mountain Green, Benjamite, Falwalder, Fornwalder, Tulpehocken, Prim's Beauty of the West, Pound, Mountain Pippin, Winter Blush, Green Mountain Pippin, Mollywhopper, Falder, Fallawalder (by Downing).

Ortley.—White Bellflower, Ortley Pippin, Woodman's Song, Greasy Pippin, Melt-ing Pippin, Yellow Pippin, Woodward's Pippin, Davis White Pippin, White Detroit, Hollow-cored Pippin, Jersey Greening, Crane's Pippin, Marrow Pippin, Ohio Fa-vorite, Willow Leaf Pippin, Detroit, Warren Pippin, Golden Pippin.

Fall Pippin.—York Pippin, Pound Pippin, Golden Pippin, Cathead Pippin, Philadelphia Pippin (by Downing).

Red Winter Pearmain.—Hornsby's Red, Kirby's Red, Red Gilliflower, Red Lady Finger, Bunkum, Jackson's Red, Buncombe, Red Vandevere, Batchelor, Southern Fall Pippin, Red Fall Pippin, Meigs, Powers (by Downing).

Pennock.—Large Romanite, Romanite, Big Romanite, Pennock's Red Winter, Prolific Beauty, Gay's Romanite.

NEW FRUITS OF KANSAS ORIGIN.

The following is a list of such as are highly promising, of the many which have been submitted this office for test of their merits:

Apples.—One from Delphos, Cloud county, Sept. 26, 1886, of which I made the following notes: Size, medium; angular form, much resembling the Mother apple; color, greenish, partially covered with broken stripes and splashes of dull red on the sunny side; . . . flesh, fine-grained, tender, flavor pleasant, mildly acid and spicy; quality, good to very good; worthy of propagation should the tree prove hardy and productive. Season, middle autumn. Not named.

Of this variety the sender says: "The tree has been in bearing five years; is a regular bearer, and has not failed to produce good crops."

Fraker's Seedling; originated in Anderson county. Size, medium to large, smooth skin, almost entirely covered with dark glossy red; flesh, yellow, like the Winesap, free grain, and slightly acid and crisp; quality good. A late spring keeper. Very handsome. The most valuable and promising seedling examined at this office for commercial purposes; kept until May 20th without any special care, in sound condition.

The Stiles, an undersized seedling, but very showy. Flesh, white, firm; flavor, mild, and of rather inferior quality. For a small apple, it is desirable on account of its very clear, handsome color and even form. Season, fore part of winter.

From Fort Scott: Size large to very large; quite regularly formed, and attract-

ive; color, clear yellow; flesh, whitish, yielding, and fair quality. Desirable and valuable as a market sort. Tree reported hardy and productive.

The Dallas; originated in Linn county. Size medium, well formed, clear skin, nearly covered with dark, glossy red stripes and splashes; flesh, yellowish, firm and crisp; flavor good. Keeps until July following in good condition. Valuable for a market sort.

The Whitman; originated in Sumner county. Size medium, well formed; color yellow, slightly striped with crimson; flesh fine grain and crisp; flavor similar to a Westfield Seek-no-further, but more tart; tree, an early and regular bearer; season, winter.

Pears.—Of the many new seedlings which have been received, only two are considered deserving of mention in this report as valuable for propagation. First, the Ayer, which originated in Douglas county. Size medium; form, obtuse, truncated, with a prominent lip covering the base of the stem; color yellow when ripened, with a dull-red cheek, rough skin, with many blotches of thin russet; flesh, firm and fine-grained; flavor, sweet and buttery. Promises to be valuable for shipping purposes. Season, October and fore part of November. Equal in all respects to the Anjou, and superior in keeping properties. Tree fairly productive and healthy.

The Martin; originated in Cowley county. Size, medium to large; irregular form—oblate pyriform; color, greenish, changing to yellowish white; skin, smooth; flesh, firm, fine grain; buttery, juicy, and fair quality. A late keeper; season, January. Tree productive and healthy. A good substitute for the Vicar, which is very subject to blight in most localities.

Grapes.—Of this class of fruit there are quite a number of varieties which give evidence of great merit, and are now under a continued test on the grounds of Mr. Burr, of Leavenworth county, and Jacob Weidman, of Lincoln county; and if their excellence in fruit and health of vine continue as at present indicated, they will be offered to the public in the near future.

This Society and the State can well afford to give every needed encouragement to the efforts being made, and which should be extended, to the production and development of new fruits. The States of Iowa, Minnesota, Wisconsin and others are making rapid progress in this direction, and appropriate annually of State funds to encourage the work, fully recognizing the importance of a progressive horticulture; and no State in the Union requires such encouragement more than Kansas, with her varied soils and climate.

ABSTRACT OF A LECTURE ON FUNGOUS DISEASES OF THE GRAPE.

BY W. A. KELLEBERMAN, PH.D., STATE AGRICULTURAL COLLEGE.

The parasitic fungi that cause disease of various kinds are so minute and so different apparently in structure from the herbs, shrubs and trees that grow in our fields and forests, that it is difficult to realize that they are veritable plants. Nevertheless this is the case. They differ from the conspicuous plants only in degree of differentiation, not at all in fundamental structure. The oak or the elm in its earliest stage is as simple as the unicellular fungus or alga. It consists of a minute mass of protoplasm, now ready to take up a career of its own. A microscopic section of the

ovule, that is, the seed in its early stage, or at the time when fertilization takes place, will plainly reveal this fact. This small mass of jelly-like substance called protoplasm, manifests its first activity by the secretion of a covering—a *cell-wall*, as it is called, for the individual mass of protoplasm that manifests these phenomena of vitality is called the *cell*. This cell divides into two masses or two cells, these divide in the same manner, each portion in each case growing to about the original size, then dividing again, and so on. A covering or cell-wall for each is secreted, and these walls are very conspicuous in every section of vegetable tissue. These multiplied cells shape themselves into the embryo or plantlet in the seed. When the embryo begins again to grow, as in germination, it is the same process again repeated, namely, a constant growth and division, therefore multiplication of the cells. The protoplasm in the cells has the power of elaborating the inorganic food materials taken up in solution by certain parts of the plant and transported to it, and the product of its activity is the food for the increase. As in the oak or the elm, the entire structure is made up of these minute and active cells; so also is the case the same for the humbler fern and moss, for the tenderer alga and fungus. The microscopic parasitic fungus, therefore, that may be for the most part buried in the host-plant, is made up of one, few, or many cells, and consequently differs from the gigantic tree in degree only; it is a plant, a vegetable organism, as really as the oak or elm.

The plants with green leaves have, when in sunlight, the power of changing the mineral materials into the so-called organic substance. This power, called *assimilation* by the botanists, is denied those that are destitute of chlorophyll—the green coloring matter; as if the protoplasm needed this screen or sieve for the intense rays. A few of the common flowering plants and *all of the fungi* have no chlorophyll, and are hence compelled to feed on *organic* matter, on animal or vegetable tissue, or their products, either while they are living, or in many cases only after their death. The parasitic fungi, which we will consider to-night, belong therefore to that group of organisms which feed on materials already assimilated, which do not require the sunlight for their growth and reproduction. They consume the elaborated food that the host-plant intended for its own use. The young ovule or seed is the favorite abode for some species, and there they revel in the choice rich materials which the foster-plant is supposing all the time to be consumed by the living plantlet just born.

A certain point in vegetable physiology should at this stage be clearly understood, for by it we may fully understand why these parasitic pests are harmful to so great a degree. It relates to the movement of materials in the plant, and is called the principle of diffusion. A single example may serve to illustrate: Suppose I withdraw from this large hall a cubic yard of the air it contains. There is at once a movement of the remaining portion in the direction of the unoccupied space. Or if I introduce some new gas into the room, it will diffuse, that is, spread itself in all directions and occupy the entire space. If again a cubic yard be removed, this new gas and all others in the room will extend themselves by the movement mentioned before. Just so it is in the plant. The crude sap taken up by the delicate rootlets and root-hairs is consumed, that is, converted into new substances, in the leaf and green parts of the plant. New material of the same kind moves to these points to occupy the space of that consumed. Likewise at the end of the stem and at all other points in the plant where growth takes place, the assimilated food is consumed in the building-up of new tissue. Therefore, toward all these places the movement takes place. As the food is consumed, still more flows in that direction. Now if a parasite takes up its habitation in some growing part of the plant, it will

consume the food materials at that place. New material will consequently move to that point to take the place of that consumed, and this will be continued till the parasite has completed its growth, or till the host-plant is exhausted. Thus we see why a parasitic fungus is so deleterious to its host-plant. With these introductory remarks, we will proceed to outline the life-history of a few of the parasitic fungi that infest the grape, and perhaps a rational mode of extermination may be partially disclosed.

Of the dozens of parasitic fungi that infect the grape, perhaps none are more destructive in this section of country than the Grape Mildew (*Peronospora viticola*), and the Black Rot (*Phydasalasporea Bidwellii*). In a brief lecture one year ago I gave you the main points of the development and reproduction of the Grape Mildew. I will now outline all that is known of the Black Rot. The first indication of disease is noticeable as a slight discoloration on some part of the berry. The color becomes darker, and finally the spot looks as if scorched. The berry may be more or less flattened at such places. Such a diseased berry is shown in the figure here inserted from Trelease's report on the Grape Rot, in Transactions Wisconsin Horticultural Society (Fig. 1). Many of these spots, if examined carefully, will show minute black points, which can be understood only when we call in the aid of the microscope. With a comparatively low power, we may, by looking at the surface of the spot, detect several hemispherical black bodies, as shown in figure 2.* From the top of each we may see a vermiform mass exuding, which, when examined with a high power, proves to be the spores of the fungus, which correspond to the seeds of the grape. We must now make a very thin section through these points, and place it on the stage of the microscope. We will then see that these apparent points were little receptacles, bearing, on minute pedicels, tiny, round or oval bodies, not properly called seeds, but spores. The third figure (Fig. 3) shows a portion of the receptacle bearing such spores. This stage, now known to be but one of three or four stages, has for a long time been known to botanists, who call it *Phoma uvicola*. The tissue forming the roundish receptacle is very compact, and of a dark color. Outside of this may, perhaps, be seen minute hyaline threads or tubes, with cross-partitions at intervals, and these constitute the vegetative part of the fungus. Had our section been made and examined when the berry just began to show signs of disease, we would have found these threads, or *hyphæ*, as botanists call them, very abundant, indeed. *Hyphæ*, more or less similar, constitute the vegetative stage of many of our very destructive parasites. That of the Grape Mildew, for instance, differs from this only in the cross-partitions, or septa, being absent. These threads or *hyphæ* of the Black Rot not only grow between the cells of the grape tissue, but they actually penetrate the cells themselves. They are provided with little out-growths (*haustoria*) that serve as suckers or absorbents. It should be mentioned

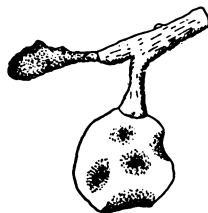


FIG. 1.

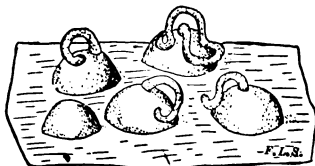


FIG. 2.



FIG. 3.

* This and the following figures are copied from Scribner's plate in the *Botanical Gazette*.

that in some cases the fruiting body or receptacle has instead of such spores as men-

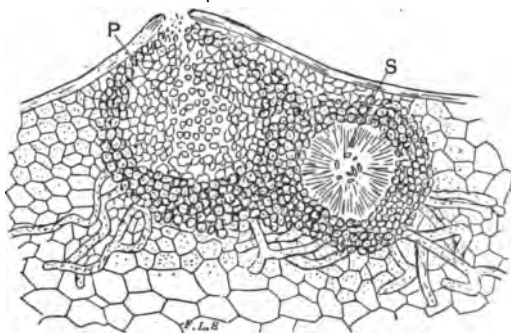


FIG. 4.

tioned above, other smaller ones, which are represented in Fig. 4. The former are called the *stylospores*, and the latter *spermatia*. The former germinate and produce true hyphæ, but the latter are little understood. In a few cases, still another kind of non-sexual spores has been noticed, called *conidia*. These are minute reproductive bodies that develop on the ends of erect hyphæ, that grow from the surface. In one

case at least, it was observed that they were developed after the diseased berry had laid exposed for a length of time. The *mycelium*, a name given to the hyphæ collectively, retains its life during the winter, and if the *conidia* are very tardily developed, they may serve as the means for the continuance of the species in the following season. More light, however, is wanted on this point.

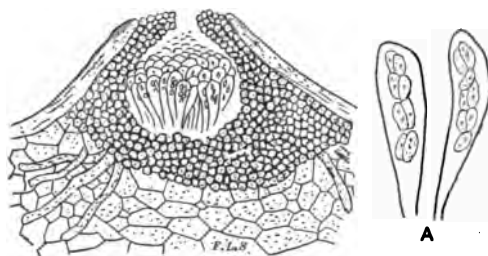


FIG. 5.

But other reproductive bodies, the fourth and final stage of the fungus, have been satisfactorily determined. Dr. Bidwell, of New Jersey, found that in old receptacles, which had borne spores the previous season, namely the *Phoma uvicola*, sac-like cells (*asci*) with eight spores in each were produced. The fact was communicated to Mr. J. B. Ellis, who upon searching found the same in old diseased berries from his garden. He described this stage, and named the fungus *Sphaeria Bidwellii* (since changed to *Physalospora Bidwellii*). This is shown in section in Fig. 5, where also two of the sacs, or *asci*, are more highly magnified, and in them are seen the eight spores. These, then, might be called the "winter-spores," developed perhaps in early spring, the more tender early spores, or "summer-spores," not being able to survive the severity of winter weather. The Black-Rot fungus, therefore, is one of the *polymorphic* forms, adapting itself, in the production of reproductive bodies, to the exigencies of the climate. While farther investigation may positively fix some of the less certain points in the life-history of this parasite, yet enough is clearly known to indicate what might be done to check the disease. It will be remembered that the fungus attacks the berries directly, and not, as in case of the Grape Mildew, by growing up into them through the stems. Inclosing the fruit early enough—say when half grown—in paper bags might then in this case prevent the access of the spores. As the hyphæ ramify through the tissue of the berry, it is evident that they cannot be killed by external application of sulphur, or any of the numerous emulsions now extensively used for such and other purposes. If, however, all the diseased berries be scrupulously burned, the disease would be checked or eradicated. It is but sowing the seed, to allow the affected berries to remain in the vineyard.

SOME INSECTS INJURIOUS TO FOREST, FRUIT AND SHADE TREES.

BY WARREN KNAUS, M'PHERSON, KANSAS.

THE ASH-BARK BORER.

(Hylesinus aculeatus Say.)

The *Scolytidae* are but sparsely represented in the coleopterous fauna of Kansas. This scarcity is accounted for in great part by the absence of forests over the greater part of the State; the natural home of these coleoptera being beneath the bark of shrubs and trees, where a large part of the imaginal, and the whole of the larval life is passed.

Of the seven or eight species of this family in this State, as given in the various reports of the Kansas Academy of Science, but three have come under my personal observation, and but one (*P. dentatus*) has actually been observed at work.

The burrows of a *Scolytid* in an ash post, which I supposed was the work of the "Ash-bark borer," came under my observation about two years ago. The work, however, was not recent, and no specimens were obtained. Specimens of the sculpture were retained, but efforts to find more recent work were not successful until about the middle of July, 1885, when I secured well-preserved specimens, though dead, of an insect from ash posts near Stockton, Rooks county, and Edmond, Norton county. These specimens proved on identification to be *Hylesinus aculeatus* Say. No growing trees were found which had been attacked, and those only were selected that were already in a decaying condition.

This insect is small, not over .09 to .13 of an inch in length. In color it is variegated, with dark brown and gray tints, with the elytral bands oblique. The body is elongate, and clothed with flat scales. Head of male more flattened than in the female. Interspace of elytra punctured. Club of antennæ oval.

The burrows of this insect were almost fac-similes in every particular, consisting of a larger central channel from 25 to 100 mm. in length and 1 mm. in width, made by the female, the young larvæ eating its way outward from this channel, the larval channels constantly enlarging during the larval life, and sinking a little deeper in the wood as the pupa state is reached. These larval channels are from 5 to 45 mm. in length and from $\frac{1}{4}$ to 1 mm. in width. The central channel is usually slightly sinuous, being governed to some extent by the surface of the wood and the number of beetles at work; they never come in contact. At about midway of the central channel there is in every instance a change of direction—a curve, sometimes hardly perceptible, at other times, and usually, very marked. The lateral larval channels extend outward at right angles from the central channel, and are about one-third the length of the former, that varying from one to three inches in length.

In November, 1885, live specimens of this insect were taken from ash trees in the western part of Davis county. The bark of these trees had apparently been abraded about a month previous, and had been at once attacked by *Hylesinus aculeatus*. Large numbers of these had eaten their way from $\frac{1}{4}$ to 1 inch under the bark from the point of entrance, and had gone into winter quarters. No larvæ of this bark borer have been observed, but the remains of many pupæ showed that the deadly parasite had done its work well.

THE JUNIPER-BARK BORER.

(Phlæosinus dentatus Say.)

Probably the most destructive bark borer known in this State is the *Phlæosinus dentatus* Say. Its attacks, so far as observed, are confined to the evergreens—junipers and arbor vitæ.

This insect was first noticed in Salina, the summer and fall of 1884, attacking the junipers on the grounds of a number of the residents of the city. They were there in great numbers, many trees having been entirely destroyed, and others badly injured. The damage was done entirely by the perfect beetle, no larvæ having been observed. The injury was almost invariably confined to the base of the lateral offshoots of the branches of the tree, the beetle burrowing under the bark, and eating around the base of the twig, causing its destruction. Every twig from the trunk outward would be attacked, and a few burrows were also observed on the stems or trunks of the trees themselves. No primary gallery of the perfect insect has been found to exceed three-quarters of an inch in length. I have found no secondary or larval galleries.

Packard, in his "Insects Injurious to Forest and Shade Trees," says he has observed this insect as early as the 1st of May. I have never observed it making attacks earlier than the 1st of September, continuing until the latter part of October.

The attacks of this insect are made on healthy trees, and I have seen no less than fifteen cedars entirely killed in the public square of Clay Center, Kansas, that would average six inches in diameter at the base. This *Scolytid* is not a native, but has been introduced in cedar posts brought to the lumber yards from Michigan and Arkansas. I have examined posts from Arkansas which contained the perfect beetle (but dead), larvæ, and pupæ. When these pupæ had completed their transformations, cedars in close proximity to the lumber yard were at once liable to attack.

The primary gallery of this insect, as examined in Arkansas cedars, is short and straight, being from 18 to 25 mm. in length, and 3 mm. in width. The gallery widens at one end into a trilobed chamber twice as wide as the main gallery. The number of lateral or secondary galleries on each side varies from 15 to 60. These secondary galleries are from $\frac{1}{2}$ to 1 mm. in width, and those arising near the ends of the main gallery are about 45 mm. in length; those arising near the middle are about one-half as long.

The burrows are about one-half in the wood and one-half in the bark. The secondary galleries rarely cross each other, and when they do it is owing to some inequality in the surface of the wood or the close proximity of the burrows.

This bark borer is not without its enemies. I found fully half the pupæ cases examined contained nothing but the remains of a parasite that had destroyed the pupa and had itself failed to escape. The perfect fly was also seen passing over the surface of the bark, seeking a favorable point to make an attack on his victim. Specimens of this fly were sent to L. O. Howard, Assistant U. S. Entomologist, who pronounced it a chalcid fly, belonging to the genus *Spolkius*.

(The description of *Phlæosinus dentatus* is omitted, as it was described in the Horticultural Report for 1885, by Prof. E. A. Popenoe.)

THE HICKORY-BARK BORER.

(Scolytus 4-spinosus Say.)

The hickory-bark borer is a coleopterous insect, belonging to the family *Scolytidae*. They are common over the eastern third of the State, infesting the various species of hickory. The perfect insect is a small beetle, varying in length from .15 to .20 of

an inch; color black, with wing covers brownish in many cases. The head is flat above, and concave toward tip. Thorax but little longer than wide. Wing covers, or elytra, have ten striæ, confused at sides but distinct and regular above, striæ composed of small deep punctures. Spaces between striæ with a row of small indistinct punctures. The head of the female is shorter than that of the male, is more rounded, and is less hairy. The larva of this insect is soft, yellowish, and without legs; mouth parts brown or dark.

The female of the perfect beetle bores through the bark in July and August, and forms a chamber parallel with the grain of the wood usually, and about an inch in length, depositing eggs along the sides of this chamber, which is partially sunk in the wood. These eggs soon hatch, and the young larvæ eat outward from the central chamber between the inner bark and sap wood. These larval channels gradually change direction until they run lengthwise or parallel with the bark.

During the winter the larva is inactive, and enters the pupa state about the end of April or May, emerging as a perfect beetle in June or July. The holes through which the beetle escapes is about the size of that made by a No. 8 shot, and when a tree is badly infested, these holes are so numerous as to look as though several charges of these shot had been fired into the tree.

These insects at once attack a tree when cut down in June or July. Many trees are also infested in the upper part of the trunk and limbs, and any injury to the bark or twigs or limbs of a tree will afford opportunity for the attack of the hickory-bark borer.

The larva of this beetle is subject to the attacks of at least two ichneumon parasites, which destroy the larvæ, and undoubtedly aid very materially in checking the ravages of this enemy of the hickory family.

THE COTTONWOOD CURCULIO.

(*Wollastonia quercicola* Boh.)

This beetle is very closely related to the *Scolytidæ* or bark borers, and is difficult to distinguish from many bark borers belonging to the above family. The habits of this insect, however, easily separate it, as it is strictly a wood-eater, the larvæ penetrating every part of the trunk of the tree, while the *Scolytidæ* work between the inner part of the bark and the wood proper.

The Cottonwood curculio is a small insect, about one-eighth to one-quarter of an inch in length; color black or brownish when immature. Thorax a little longer than wide, and rounded. Club of antennæ flattened and truncated, or cut off at the tip, and spongy. Wing-covers striate and punctured.

The perfect insect emerges during the latter part of May and June, large numbers of them being found around old and decaying cottonwood logs. The beetle is sluggish in movement, and easily captured. The larvæ are small, white and semi-transparent, and footless, with mouth parts and head dark or brownish. They are dormant during the winter and go into the pupa state in April or the first part of May.

They perforate the wood in every direction, preferring, however, that it be dry and slightly decayed. The perfect beetle also occurs abundantly in the burrows, large numbers being taken during the winter and early spring months. The larval channels preferably follow the grain of the wood, and two seldom interfere or come in contact.

I have not observed the work of this insect in the growing tree, and do not think the tree is open to attack unless some part of it is injured or partially decayed.

THE PLUM GOUGER.

(Coccotorus Scutellaris Lec.)

This curculio, more injurious in my opinion to the plum than the well-known plum curculio (*Conoleachelus nemuphæ*), is common over central and eastern Kansas, and should be well known to every horticulturist. The insect is longer than the plum curculio, being fully .25 of an inch in length. Color of thorax yellowish; of elytra or wing-covers light brown. The elytra are covered with fine and dense hairs; the striæ fine, and the interspaces flat. At the base of the elytra are two small tufts of hair, on each side. The antennæ are slender, with club or tip elongate, oval, pointed, and articulated. The thighs are armed with a tooth. Bead rather long. The perfect beetle appears the latter part of May, and is to be found during the greater part of June. The eggs are deposited in an incision made in the plum by the beak of the female gouger. The eggs hatch, in a few days, and the young larvæ penetrate into the interior of the kernels, where they feed and soon cause the plums to stop growing and fall to the ground. The larvæ afterward leave the plums and penetrate the ground, where they complete their transformations, emerging as perfect insects the following spring.

The work of the plum gouger is easily distinguished from that of the plum curculio by the appearance of the incision in the plums. The gouger makes a single incision, while the plum curculio, after depositing the egg in the opening prepared, makes with her jaws a half-moon cut over the opening, as a precaution to prevent the rapidly-growing plum from expelling the newly-deposited egg.

Another distinction between the work of the larvæ of the two species is in the food habits, the larvæ of the curculio eating the substance of the plum without the stone part, while the gouger larvæ feeds on the substance of the inclosed kernel.

Much of the destruction of our plum crops attributed to the plum curculio, I feel confident from an observation of several years, is really the work of the plum gouger. In collecting these two species for the past six years from three or four localities in the State, I have in every case except the past season found three goug-ers to one curculio. The past season but few of the former species were taken, while the curculio was more numerous than usual, although the damage inflicted was comparatively light, not more than one-third of a very full crop in central Kansas being damaged. The ravages of the plum gouger can be best guarded against, I think, by daily jarring or hand-picking during the latter part of May and the whole of June. The application of a kerosene emulsion at proper times, I have no reason to doubt, would be of great benefit in preventing attacks, as all insects will succumb to an application of kerosene, or any oily substance capable of rapid diffusion.

"CURCULIO-PROOF" APRICOTS AND PLUMS.

BY THE SECRETARY OF THE KANSAS STATE HORTICULTURAL SOCIETY.

The following letter is given as a sample of many received at this office during the past year; and as it presents a subject of importance to both the nurseryman and planter, and that the latter may be protected from the injury being perpetrated upon him by untruthful representations, and the former from the liability of an un-

merited charge of fraud, it is deemed best to publish it, and with it the information obtained from authorities of an eminent character:

KENT, KANSAS, December 11, 1886.

MR. G. C. BRACKETT—*Dear Sir:* Please give me what information you may possess regarding the Mariana plum as being curculio-proof, as there are agents of an Eastern nursery canvassing this section, who claim that this variety of plum is never affected in any way by the curculio. Please answer soon, and oblige.
Yours, etc.,

Upon the receipt of this letter, the question was at once propounded to Prof. C. V. Riley, Chief of the Division of Entomology, United States Department of Agriculture, Washington, D.C., Prof. S. A. Forbes, State Entomologist of Illinois, Prof. J. A. Lintner, State Entomologist of New York, and our own Prof. Frank H. Snow, of the Department of Natural History, at the State University.

"*Question:* In your opinion, is there any variety of the plum family whose fruit would be proof against the attacks of the plum curculio?"

REPLIES.

UNITED STATES DEPARTMENT OF AGRICULTURE,
DIVISION OF ENTOMOLOGY, WASHINGTON, D. C. }

FRIEND BRACKETT: Yours of the 15th has been handed me by my assistant. Replying, if you want my opinion from all the facts on record, and from my experience, so far as it goes, I would say, that there is no reason why any should be exempt. I recollect distinctly how, many years ago, the Wild Goose plum was claimed to be curculio-proof, and how subsequently the claim was necessarily abandoned. Experience in Russia is of but very little value to us, because, so far as we know, our plum curculio does not occur there.
Yours very truly,
C. V. RILEY.

OFFICE OF STATE ENTOMOLOGIST, CHAMPAIGN, ILLINOIS.

MR. G. C. BRACKETT—*Dear Sir:* I have no personal knowledge of any plum that is curculio-proof, nor of any such variety of any other fruit subject to the attacks of that insect. I suppose there is no doubt that some varieties are less liable to injury by the curculio than others, but I do not believe that any one is exempt from it.
Very truly yours,
S. A. FORBES.

STATE OF NEW YORK,
OFFICE OF THE STATE ENTOMOLOGIST, ALBANY. }

MR. G. C. BRACKETT—*My Dear Sir:* Replying to your letter of recent date, I do not believe that any variety of plum will be found to be exempt from curculio attacks, nor should I expect to find any particular partiality of the insect for special varieties. I base this opinion upon the fact that the curculio is not confined to the plum, but frequently attacks and injures seriously apples, also cherry, pear, peach, and the thorn-apple.
Very truly yours,
J. A. LINTNER.

THE UNIVERSITY OF KANSAS, LAWRENCE, — 1886.

MY DEAR MR. BRACKETT—In answer to your question, I do not believe there is any variety of plum whose fruit will be exempt from the plum curculio and plum gouger, nor do I believe that those insects have a natural instinct prompting them to select certain varieties of plum for oviposition.
Very truly yours,
F. H. SNOW.

There is no question as to the soundness of these gentlemen's opinions, nor of the falsity of the oft-repeated declaration found in some nurserymen's catalogues that the Russian apricot is exempt from the attacks of the curculio, as there is an abundance of evidence to be found in the orchard of this fruit in western Kansas, and where it was first introduced, most every season. Whole crops were nearly ruined by its prevalence in 1885. It is to be regretted that so valuable a variety of fruit is not exempt from the ravages of insects, but like the peach and plum, it cannot escape, except by the interposition of carefully-applied methods for the destruction of this species of enemies.

While such are the incontrovertible facts, why delude the people? Such conduct will react sooner or later upon the reputation of any salesman or nursery, and the loss will be greater in the end than all present gain. It not only takes hard-earned money from the planter, but also causes a discouragement; creates a suspicion which bars all future traffic in the same quarter. Such delusions are the height of folly, viewed from the point of nurserymen's interest. The interests of the planter and nurserymen should be mutual, and the relation between them of the most friendly

character, for the nurseryman cannot live by his business unless supported by the planter. But the planter can, for a little practice would soon render him capable of doing all the propagation required to keep up his chosen industry. "Where there is a will there is a way," is an old saying, and the will often asserts itself even among horticulturists.

VINEYARDS.

REPORT OF STANDING COMMITTEE—JACOB WEIDMAN, PLEASANT VALLEY, LINCOLN COUNTY.

The winter of 1885-86 was very severe on unprotected grape-vines, but where the rows were planted east and west, and not pruned in the fall, snows drifted among them and afforded a protection which carried them through safely, while such as were planted north and south suffered badly, no matter what varieties were used; whether called hardy or tender, all suffered alike.

All the old vineyards bore a good crop of fruit, both in quantity and quality. Their wood growth was medium, but well matured, and there is a good prospect for a crop in 1887. The Concord, Ives, Elvira, Perkins, Noah, Missouri Reisling No. 1, are the leading varieties in this part of the State, and all have been successful. Grape rot has not been troublesome to these varieties. The Telegraph is an excellent sort, but I cannot succeed with it on account of rot in the fruit. It does very well on the farm of Mr. Gottlieb Bircher, five miles north of Wilson, in Ellsworth county, on sandy upland. Very few vineyards are planted in western Kansas yet, as the old story "will not grow or fruit," still has believers. I am satisfied that they will do far better here than in the extreme eastern countries, and require no more care than a crop of corn or potatoes after once trellised.

Many new varieties are bought by our people at very high prices, which are worthless for this locality at least, if not for any other.

The Pocklington is fruitful, but a weak vine. I have fruited the Niagara this year for the first time, but I do not believe it will prove hardy in our winters. Its fruit is very fine and the vine productive, but no better than the Goethe. The roots are too fleshy for endurance.

The Jefferson and Prentiss will prove worthless in the west. Brighton is no better than the Concord. Martha, Moore's Early and Lady are hardy, but not productive.

The following I consider valuable: Missouri Reisling No. 2, Grein's Golden, Martha Seedling, Amber, and especially the Martha Seedling, which bears good crops each year.

Grape culture intelligently conducted will prove profitable in central and western Kansas. Some varieties which succeed near the Missouri river, will not here.

The early-planted vineyards suffered from attacks of native insects, and even now the leaf-folder is complained of in some localities, but all these can be easily controlled. I will here give a list of such varieties as I have tested, and my opinion of each:

CLASS I—FOX GRAPES.

1. Concord, good; 2. Ives, good; 3. Dracut Amber, good; 4. Martha Seedling, good; 5. Cambridge, very good; 6. Perkins's Early, good; 7. Brighton Early, good; 8. Early Victor, good; 9. Champion, early, good; 10. Catawba, late, good; 11. Northern Muscadine, questionable; 12. North Carolina, questionable; 13. Hartford, good; 14. Chal-

lenge, good; 15. Martha, questionable; 16. Prentiss, worthless; 17. Duchess, worthless; 18. Isabella, worthless; 19. Jefferson, worthless; 20. Lady, worthless; 21. Diana, good, tender; 22. Moore's Early, good, shy bearer.

CLASS II—FROST GRAPES.

All the following are good: Elvira, Missouri Reisling Nos. 1, 2 and 5, Amber, Grein's Golden, Noah, Clinton, Taylor, Pearl.

Questionable: Marion, Black Taylor, Uhland, Transparent.

CLASS III—SUMMER GRAPES.

Hermann, good; Neosho, very good. Questionable: St. Clair, Norton Virginia, Cynthiana, Hermann (white).

CLASS IV—SOUTHERN SUMMER GRAPES.

Delaware, good; White Delaware, good; Louisiana, good, tender; Humboldt, good; New Jersey, good; Herbemont, good, tender; Cunningham, good, tender; White Muscatelle, good.

ROGERS'S HYBRIDS.

Goethe No. 1, good, tender; Goethe No. 2, late, good, tender; Massasoit No. 3, good, hardy; Wilder No. 4, good, plant weak; Agawam No. 15, subject to rot; Merrimac No. 19, worthless; Aminia No. 39, worthless; Salem No. 53, good, subject to rot; Triumph, tender; Black Eagle, subject to rot.

I have many others which have not been fully tested. For general purposes, only five or six varieties are valuable.

REPORT ON THE GRAPE CROP OF 1886, AND THE COST AND PROFITS OF ONE ACRE OF GRAPES.

BY G. F. ESPENLAUB, ROSEDALE.

The extreme wet season of 1885 brought with it that destructive malady to the grape, the mildew. Most all varieties were entirely defoliated some time before the grapes were ripe. This left the young wood in an unripe and weak condition for the very cold winter that followed. Thus we can easily account for the light crop of the season just past; for, just as each variety or vine suffered from mildew the previous year, so they put forth efforts to bear a crop this year. Among those that suffered most was the Delaware, and Catawba next. All the Rogers hybrids—in fact, all the thin-leaved kinds—suffer first from mildew. Grapes have passed through the past season without any trace whatever of mildew or rot, and prices held up well. The crop on an average was about sixty per cent. Those kinds that bore a full crop were: Ives, Early Victor, Telegraph, Elvira, Noah, Diana, Norton, and Cynthiana. The wood growth the past season has been very fine, all of which matured exceedingly well before the approach of autumn, and is now in best condition to withstand a cold winter.

An account of the receipts and expenses of one acre of vineyard for the first ten years after planting:

RECEIPTS.

By crop raised on ground first and second years.....	\$28 17
By first crop, third year, 1,000 pounds, at 5 cents.....	50 00
By seven subsequent crops, (807 vines to an acre, yielding 7½ pounds per vine = 6,052½ pounds,) 42,367½ pounds, at 3 cents per pound.....	1,271 02½
Total.....	\$1,349 19½

EXPENSES.

First and second years:	
Preparing ground, plowing, subsoiling, harrowing, and marking off furrows.....	\$5 00
807 two-year-old plants (Concord's).....	20 17
Two days' planting, at \$1.50.....	3 00
Third year:	
430 posts for trellis, at 10 cents.....	43 00
Setting same, at 3 cents.....	12 90
725 pounds of No. 12 plain wire.....	29 00
Two days' running wire, at \$1.50.....	3 00
Care and culture each year as follows:	
Four days' spring pruning, at \$1.50.....	\$6 00
Two days' tying vines to trellis, at \$1.50.....	3 00
Four cultivations, at \$2.....	8 00
Four days' hoeing, at \$1.50.....	6 00
Summer pruning.....	2 00
Sundry expenses.....	3 00
Making a total for seven years of.....	196 00
Ten years' rent, at \$4 per acre.....	40 00
Total expense of gathering and marketing crops, 30 per cent. of total sales.....	396 00
Total.....	\$748 07

SUMMARY.

Total receipts for ten years.....	\$1,349 19½
Total expenses for ten years.....	748 07
Net profits for ten years.....	\$601 12½
Net profits for one year.....	\$60 11½

GRAPE ROT.

BY PROF. F. HAWN, LEAVENWORTH.

The circular interrogatories of the Agricultural Department, at Washington, on the subject of black grape rot have been considered, not in the categorical order in which they are presented, for the subject is too complicated for a proper understanding, without an examination of the different atmospheric combinations in which this grape rot has been developed and sustained. The questions of the circular presuppose downy mildew—a probable factor in the black grape rot—"and the rot appears . . . usually after pretracted rains, fogs, or heavy dews, succeeded by hot weather." While this is emphatically true in the development and growth of downy mildew, it is not a definite combination in grape rot. The general conclusion is that the Concord grape is one of the persistents in rotting, yet its foliage is rarely attacked by downy mildew, and more rarely damaged by it, while such varieties as the Delaware, Salem, Catawba, etc., rarely mature their fruit, in consequence of the disintegration of their leaves by downy mildew, but none of these varieties are specially subject to rot, and some of them are entirely exempt. The atmospheric combinations in which black grape rot is developed are not so definite, if it is in any way connected or promoted by them.

In illustrating the peculiar atmospheric conditions in which grape rot has been evolved, I quote largely from my reports to the Kansas State Horticultural Society for the years 1880 and 1883, and others of more recent date.

The United States Signal Station here at Leavenworth, reported the following for the month of June, 1880:

"The past month was notable for high mean temperature and small amount of rain. Although rain fell on ten days, the total rainfall for the month, 1.69 inches, is the smallest on record at this station, and the atmospheric humidity 6 per cent. below the June average."

The month of May of that year closed with more than a needful supply of water in the ground. On the 10th day of June the mean temperature went up to 8° above the normal, and ranged above for five days, and on the sixth day it fell 12°, or 4° below the average. On the 10th, the mean atmospheric humidity which had remained above for several days, fell to the normal, and clustered around that point for four days. During this period rot prevailed, and to the amount of 5 per cent. loss. The atmospheric conditions of this period are more definitely represented as follows: Daily mean temperature on the 10th was 81.5°; 11th, 80.2°; 12th, 80°; 13th, 80.5°; 14th, 76.5°; and on the 15th 68.5°, a material fall in temperature. The humidity for the same period, on the 10th, was 66 per cent.; 11th, 68; 12th, 69; 13th, 69.3; 14th, 66.7; and on the 15th, 59 per cent.—the normal about 67 per cent. The rains that may be considered a factor, were on the 4th, .13 inch; 5th, .16; 7th, .22; and on the 10th, .22 inch.

The month of July was ushered in with 5.56 inches of rain in the first three days, which saturated the soil to repletion. For five days the mean temperature and humidity ranged above their normals, or in more specific terms as follows: The mean temperature on the 1st was 78.5°, 2d, 75°; 3d, 72°; 4th, 77.2°; and on the 5th 72.5°. The mean atmospheric humidity on the 1st was 72.3 per cent., 2d, 79.3; 3d, 82.3, 4th, 74.7; and on the 5th 76 per cent., while the normal was 67 per cent. These were very favorable conditions for propagating downy mildew, but no black grape rot appeared. On the 15th grape rot made its appearance and progressed in a falling temperature and in a humidity below the normal. On the 15th the mean temperature was 78.7°; 16th, 75°; 17th, 76.5°; 18th, 79.2°; 19th, 70.7°; 20th, —; and on the 21st, 71.2°—the normal being 78.5°. Humidity on the 15th was 64 per cent.; 16th, 56.3; 17th, 59; 18th, 60.7; 19th, 58.7; 20th, 54.7, and on the 21st, 50.3 per cent.—the normal being 67.6 per cent.; consequently the atmospheric humidity of each of the days from 15th to the 21st was much below the daily average. During this period the temperature fell (on the 20th) 56°, the lowest July temperature at the station up to that time, and other records extending back to 1865, and a daily mean of 68.5° or 10° below the normal. The loss from this rot was about 30 per cent.

The following table of details will not be uninteresting in an analysis of this phase of the grape rot:

DATE.	Minimum temperature.....	5:48 A. M.			1:48 P. M.			9:48 P. M.			Rainfall, inches.....
		Temperature.....	Dew point.....	Humidity, per cent.....	Temperature.....	Dew point.....	Humidity, per cent.....	Temperature.....	Dew point.....	Humidity, per cent.....	
1886.											
July 15.....	73°	75°	69°	81	87°	70°	58	74°	57°	55	.....
July 16.....	63	66	57	74	79	55	43	77	60	57	.....
July 17.....	65	67	58	74	83	53	37	72	64	76	.03
July 18.....	68	70	62	75	85	63	47	79	65	62	.....
July 19.....	66	69	61	75	76	50	41	66	58	64	.06
July 20.....	56	60	50	71	75	46	37	67	52	60	.....
July 21.....	58	61	49	66	76	45	34	72	51	54	.....

The report of the Signal Station here for June, 1883, is as follows:

"The special features of the month, the low mean temperature and the excessive rainfall, it be-

ing the largest during any June on the records of this station. The mean temperature was 3.6° below the June average."

The lowest thermal range was 47°, within 4° of the lowest on the records of this vicinity, extending back to 1832.

"The mean per cent. of humidity for the month was 7.5 per cent. above the June average, and the highest mean on our record. The total rainfall was 10.48 inches, which is nearly double the average for June; of this amount 3 inches fell in about three hours on two consecutive days—16th and 17th."

In those days (16th, 17th) the mean temperature was 76° and 74°, and the minimum 69° and 67°; conditions very favorable for the development of grape rot on the theory of heavy rains and hot weather, especially as it was in the season in which rot more often appears—but none followed. These were not the only dates when such favorable combinations prevailed, as on the 20th the mean temperature reached 80°, maximum 91°, and when a slight rain fell during the day. These were the most prominent of the month, and suffice for the present.

The summer rains virtually ended on the 23d of June. From that date to the 24th of July rain fell in small fractions on ten days, amounting to 1.73 inches, and vegetation was suffering from drouth. On the 25th, rot was discovered. On that day the mean temperature was 80°, the maximum 90°, and the minimum 71°. Such relative combinations had measurably prevailed for five previous days. From the 25th to the 30th the rot made sensible progress, accompanied with a marked decrease in the temperature. The minimum once descended to 63°, and a mean of 67°. Or, in more detailed terms, the mean temperature on the 24th was 80.7°; 25th, 80°; 26th, 77.7°; 27th, 74°; 28th, 72.3°, and on the 29th, 69.7°. On the 23d rain fell to the amount of .05 inch; on the 25th, .14 inch; on the 27th, .04 inch, and on the 29th, .09 inch. On the 30th rain fell to the amount of 2.07 inches, accompanied by still lower temperatures, the daily mean at 67°, and the minimum 59°, and falling to 55° on the 4th. This cold rain of the 30th gave the grape rot an impulse that lasted to the end of the season, with a loss of seventy-five per cent. An equally disastrous rot occurred in the cold rains in June, 1885.

The following table gives the atmospheric details of that interesting phase in grape:

DATE.	Minimum temperature.....	5:48 A. M.			1:48 P. M.			9:48 P. M.			Rainfall, inches.....
		Temperature...	Dew point.....	Humidity, per cent....	Temperature...	Dew point.....	Humidity, per cent....	Temperature...	Dew point.....	Humidity, per cent....	
1883.....											
July 25.....	71°	73°	67°	82	89°	64°	44	78°	69°	74	.....
July 26.....	68	71	61	71	89	64	44	78	68	84	.14
July 27.....	67	71	65	82	77	68	74	74	63	68	.04
July 28.....	64	67	56	68	80	51	37	70	62	76	.....
July 29.....	65	68	58	70	74	63	68	67	64	90	.09
July 30.....	59	62	58	87	64	59	84	65	58	78	2.07
July 31.....	62	65	60	84	70	63	78	68	65	90	.....
August 1.....	64	66	64	93	78	65	64	78	68	84	.08
August 2.....	64	69	62	78	77	58	52	66	55	68	.....
August 3.....	58	60	50	70	70	49	48	61	54	78	.....
August 4.....	55	60	56	87	76	53	45	68	61	78	.....

The July nominal temperature (daily mean) being about 78°, and for August the daily mean 75°.

The most favorable opportunity for ascertaining definite points in grape rot occurred this summer. A neighbor near by had been working in his vineyard to the close of the day on June 12. The work consisted in sacking grapes. Had the least indication of rot appeared, from the nature of the work, it would have been detected. On Monday, the 14th, when the work of sacking was to be resumed, he found 30 per

cent. of his grapes destroyed by rot. This was verified by my observation. On Saturday, the 12th, the temperature throughout the day was very uniform, the mean being 77.9°, the maximum 90.2°, and the minimum 71.3°; humidity high, with a slight sprinkle of rain. On the 13th the mean temperature was 80°, the maximum 91.3°, and the minimum 71.5°, the humidity somewhat above the preceding day, and the dew point much higher. That the subject may be more thoroughly examined, I append the atmospheric details from the beginning of the month, in the following table:

DATE.	Minimum temperature.....	5:48 A. M.			1:48 P. M.			9:48 P. M.			Rainfall, inches
		Temperature..	Dew point.....	Humidity, per cent.....	Temperature..	Dew point.....	Humidity, per cent.....	Temperature..	Dew point.....	Humidity, per cent.....	
1886.											
June 1.....	68°	70°	66°	86	90°	72°	55	68°	64°	89	.69
June 2.....	58	67	62	83	71	57	62	59	50	71	.15
June 3.....	55	55	47	75	67	44	44	57	50	79	.....
June 4.....	54	56	50	77	71	49	46	62	58	86	.....
June 5.....	61	62	55	79	79	63	58	68	63	83	.....
June 6.....	63	66	60	82	81	65	58	69	66	90	.19
June 7.....	64	65	61	87	82	65	56	72	61	68	.....
June 8.....	63	66	59	79	79	69	72	68	68	98	.79
June 9.....	62	65	63	93	86	67	54	71	70	96	.01
June 10.....	63	65	62	90	87	59	39	73	66	78	.....
June 11.....	67	69	64	82	87	69	55	79	67	65	.....
June 12.....	71	74	68	82	88	73	61	72	69	92	.02
June 13.....	70	72	68	90	89	74	61	79	76	90	.....
June 14.....	70	75	69	82	89	73	60	80	74	84	.....

The tabular exhibits show that the atmospheric combinations on the 12th and 13th were not peculiar to those dates, but had prevailed with slight variations on preceding days and measurably on succeeding days. Yet the amount of rot clustering about those dates (13th and 14th) was as great as on the extension up to date (July 31st.) The rot, after the first few days, was constant and insidious through all atmospheric conditions. Rarely a day passed without continued evidence of its presence, and in many a day when the temperature was above 90° and in those torrid days in July when the thermometer marked 98.8° and in other places 100° and 104°, and 102° at my place, the humidity on two days fell away to 34 per cent. or about 33 per cent. below the normal. This, too, when we were in the midst of a protracted drouth, when vegetation was languishing and the grass of the pastures drying to a crisp. No rains had fallen since the 26th of June, and all presages of rain were as illusive as the mirage of the deserts.*

The following table exhibits atmospheric details of those torrid days:

DATE.	Minimum temperature.....	5:48 P. M.			1:48 P. M.			9:48 P. M.		
		Temperature..	Dew point.....	Humidity, per cent.....	Temperature..	Dew point.....	Humidity, per cent.....	Temperature..	Dew point.....	Humidity, per cent.....
1886.										
July 10.....	70°	71°	66°	83	87°	64°	48	74°	66°	75
July 11.....	65	71	63	76	88	59	39	75	66	74
July 12.....	65	69	62	79	92	60	34	77	68	75
July 13.....	72	74	64	71	99	66	34	83	63	49
July 14.....	71	72	62	71	88	64	54	72	66	81
July 15.....	66	66	58	74	81	60	49	71	57	63

* On the 29th rain fell to the amount of 1.63 inches, and no grape rot appeared thereafter.

The investigation shows that grape rot develops in most any atmospheric combination, providing the requisite humidity prevails (above the normal) in any portion of the twenty-four. Yet there seems to be a collateral, undefined sympathy in its inception, developing in one period when like conditions had previously prevailed. Nor do the same results obtain in different neighborhoods or always in the same localities. Moreover, the fruit of individual vines are more prone to rot years after than others in the same vineyard.

We have had in our neighborhood two successive seasons of grape rot of opposite atmospheric characteristics, and of equal destruction. Last year, the crisis came, and most of the damage was done in a few days of rainy, cold weather about the middle of June, but was protracted well into July, accompanied by heavy rains and hot weather. This year, the crisis came the 13th June, in bright sunshine, high temperature, and a reasonably humid atmosphere, and was sustained, to a limited extent, through a hot, dry atmosphere up to the present time; and the end is not yet.

In the spring of 1883, I cut away an old Concord vine at the surface of the ground, and trained the new growth for a subsequent crop. After a year's growth, it produced a moderate crop of perfect grapes, though the fruit of other Concords not so treated were well-nigh a total failure, while my neighbors near me fared no better. In the spring of 1884, I subjected four other old Concords to a like mode of pruning. These, after a year's new growth, and the vine bearing a second crop after having been cut down, produced as good crop of grapes as one could wish; only a few isolated berries appeared on some of the vines. I had no means of contrasting these results with old vines on my own grounds, as in despair I had cut them all away in pursuing the experiment, but on my neighbors' grounds, twenty rods away and all around me—on high grounds and flat grounds alike—the rot prevailed to the destruction of the market value of their grapes.

The vines I had cut down in despair last year, have produced a different sensation this year. They are now bearing their first fruit with those vines with their third and second crop after being cut down, and are practically perfect crops. A few vines have occasionally isolated rotten berries, but not in an amount sufficient to affect their market value, but my neighbors' grapes all around me have again been stricken with rot, and are now well-nigh valueless. Paper sacking was not a protection.

Whether the good results of my regenerated vines will be uniform, and obtain on different soils and exposures and with other varieties than the Concord, is yet to be determined. It is evidently not a specific; but I have a well-grounded hope that it will restore the Concord to usefulness and former popularity.

I would again call your attention to the methods of Mr. John Burr, the veteran horticulturist of national reputation, the originator of three unsurpassed varieties of grapes—Victor, Jewel, and Ideal. He gives his vines the utmost latitude consistent with the amount of fruit he wishes to produce. He maintains a balance between the root, vine, and the fruit. Among his selections are varieties noted for their rotting, but on his grounds they never rot to any appreciable extent. His garden is surrounded on three sides by buildings, on the south by trees, with trees, shrubs and arbors on the inside—all as near the habitudes of the ancestors of our grapes as it could well be rendered by art. It may be eventually ascertained that the farther we recede from those ancestral surroundings and the growth of the vine in its normal state, the greater will be our difficulties. Experiments should be conducted on that line.

The meteorological elements are from the records of the United States Signal Service station at Leavenworth, Kansas, and furnished by the courteous observer, L. A. Walsh, in charge, and fully apply to the localities here considered.

DESCRIPTION OF NEW SEEDLING GRAPES.

BY JOHN BURR, LEAVENWORTH.

Early Victor.—Bunch medium, often shouldered, compact; berry medium, black, with a fine, blue bloom; flesh tender, juicy, vinous, sprightly, sweet, quality very good; vine vigorous, hardy, healthy, and very productive; season very early, two weeks before Concord; valuable for table or wine.

No. 1, *Jewel*.—Bunch medium, often shouldered, compact; berry medium, black, with a heavy, fine bloom, handsome; skin thin, tough; pulp tender, rich, spicy, sprightly, and sweet to the center; seeds few, very small; quality best, pure, equal to the Delaware; vine vigorous, hardy, healthy, and very productive; never known to rot or mildew; season a week before Victor, and of decidedly better quality; will hang on the vine long after ripe in good condition, without losing flavor; a seedling of Delaware.

No. 2, *Standard*.—Bunch large, shouldered, rather compact; berry medium to large, with a fine, blue bloom; pulp tender, juicy, vinous, sprightly, sweet, of the best quality; will keep a long time after ripe on the vine in perfect condition; vine very vigorous, hardy, healthy, and very productive; free from rot or mildew; season about with Concord; a very valuable table or wine grape, makes a choice light or straw-colored wine of high character; a seedling of Delaware, of the same lot as the Jewel.

No. 6, *Daisy*.—Bunch and berry medium; berry oval, red; pulp tender, rich, spicy, with a fine, delicate flavor; quality very good; vine strong and vigorous; pretty hardy, more so than the Goethe, of which it is a seedling; ripens soon after Concord.

No. 7. Bunch medium, berry medium, oval, color red, pulp tender, sweet and rich, and of superior quality; vine very vigorous, healthy, and about as hardy as Daisy, and of the same origin.

No. 8. Bunch medium, berry large, dark red, pulp tender, juicy, rich, of a high Catawba flavor, of best quality; vine very vigorous, healthy, and about as hardy as Salem; season very late; will no doubt prove a very valuable market or wine grape south of this.

No. 9, *Ideal*.—A seedling of Delaware, the same color, but three times its size; bunch shouldered, compact; pulp very tender, melting, juicy, sprightly, sweet and delicious, quality the very best; bunch and berry as large as Catawba; vine vigorous, hardy, healthy, and very productive, free from rot or mildew; season about with Delaware.

No. 10. Bunch and berry medium, color red; pulp tender, juicy, very sweet; quality very good; vine vigorous, hardy and healthy, very promising.

No. 11. Bunch medium, berry large, color red; pulp very tender, juicy, rich very sweet, of the highest quality; vine vigorous and healthy.

No. 12. Bunch small, compact, berry small, white, tender, rich and sweet, of the Elvira type, subject to crack like it; vine very vigorous, very hardy, healthy and very productive.

No. 13. Bunch medium, berry very large, black, with a heavy bloom, flesh rather pulpy, like Concord, but of rather better quality; vine very vigorous, hardy, healthy and productive; may prove a valuable market grape.

No. 14. Bunch medium, compact; berry very large, white; flesh tender, juicy,

with little pulp, and of very good quality; vine very vigorous, very healthy and productive. The largest white grape I have seen; season a little later than Concord. Very promising.

No. 15, *Progress*.—Bunch medium to large, quite compact; berry large, medium, black, with fine bloom; pulp tender, juicy, rich, spicy, vinous, of the best quality; vine very vigorous, healthy, and very productive; season a little later than Concord. A very promising grape, of high quality.

No. 16. Bunch and berry medium. A promising late white grape.

No. 17. Bunch and berry small, white. A grape of fine quality, and very promising.

No. 18. Bunch large, shouldered, not very compact; berry medium, yellow, almost transparent; pulp tender, juicy, rich, sweet, with a fine, delicate flavor; vine very vigorous, hardy, healthy, and productive; season about with Concord. A very promising grape.

No. 19. Bunch and berry small, white; a sweet, very tender, and pleasant grape; vine vigorous, very hardy, and healthy; very promising.

No. 3. Vine vigorous, hardy, and healthy; bunch and berry medium, black, compact, tender, juicy, sweet; ripens about with Concord. A promising grape.

No. 5. Bunch and berry medium, white; quality good.

A number of the grapes mentioned have not yet been sufficiently tested to give a full description of them.

The Early Victor is the only one of the number that has yet been put on the market. The Jewel will be put on the market next fall.

The Early Victor, Jewel, Standard and Ideal overbear, and one-fourth to one-third of the fruit should be taken off, (especially while the vines are young;) if not, it weakens the vines and takes some time for them to recover.

GRAPE CULTURE IN BOURBON COUNTY.

BY PETER MOYER, XENIA, BOURBON COUNTY.

In February, 1880, I planted 200 vines on a piece of land gently inclined to the north, which had previously been subsoiled, where the rows were to be made, to a depth of 15 inches, and the earth turned back to form a ridge for the plants. I used bones freely at the bottom of holes made for the plants. The rows were formed eight feet apart, and two-year-old plants selected. These were highly cultivated, and allowed to trail on the ground the first year. They were trained to a wire trellis, three feet from the ground, in the spring of the second year. After having been closely trimmed, a wire was added on one side, about eight inches out and ten inches above the other, as a support of the new growth, against winds, and its fruit. The second year close trimming was given, leaving only two or three buds of the spur growth, and good cultivation given, and during winter a heavy mulching to protect the roots from severe changes in weather. I have also practiced each year turning the earth to the rows in the fall, and throwing it back in the spring; the winter mulching has also been drawn from the rows into the space between, each spring. The past year I gave the vines a pruning of their surface roots to the depth needed in cultivation. The fruit grew throughout the past year's drouth without any check, and the vines not even wilted, which was complained of by many growers. Bunches

were found in my vineyard, the present year, which weighed $1\frac{1}{2}$ pounds, and the largest berry measured $\frac{1}{4}$ of an inch in diameter. The largest six-year-old vine measured at the ground two inches in diameter.

CROPS.—That in 1882 paid all expenses to date; 1883, sold for \$40; 1884, \$20; 1885, 1,305 pounds, for \$65; 1886, two tons, which brought me \$91. Pruning is done in early spring and before the sap starts, and summer pruning by cutting off the stem growth, just beyond the last forming bunch, as soon as out of bloom, after which the summer's growth is thinned out, where too densely formed. I have only the Concord fruiting.

REPORT OF THE COMMITTEE ON ORNITHOLOGY.

BY DAVID E. LANTZ, M.SC., AGRICULTURAL COLLEGE, MANHATTAN.

Upon assuming the responsibility of preparing for this Society a report upon the subject of ornithology, I anticipated that my duties would permit time for some original investigations as to the food habits of our common birds. In this I have been disappointed, and am therefore unable to report anything *entirely new* upon the subject. I shall, however, attempt to present some interesting facts gleaned from the observations of others, so that the members of our Society may know something of the present state of knowledge upon the subject.

The question of the general usefulness of birds upon the farm and in our gardens and orchards, is not now an open one, but is everywhere acknowledged and understood among intelligent people. But there still exists a wide difference of opinion as to the usefulness of many species. Not only do fruit-growers and farmers differ upon this subject, but those who have made bird-life a study also disagree; some declaring for the protection and others for the destruction of the same species.

In view of this chaotic state of public opinion, it is fortunate that steps are being taken to obtain more accurate information than we now have concerning the food of birds. Certain it is, that data collected from a wide field of observation and based upon careful analyses and examinations of the stomachs of birds will be worth more than the statement of local observers who have seen blackbirds stealing corn or robins destroying the grape crop, and who therefore conclude that destructive warfare is to be waged upon the offenders.

Meanwhile, individual investigation has been continued, and the results have been given to the public in various reports and bulletins. Some have been of great value, as indicating the proper direction in which our observation should continue. Others show unexpected results and conclusions.

One of the earliest, and certainly the greatest, of American ornithologists, Audubon, was a most careful observer of bird habits, and his testimony is almost uniformly in favor of the birds. Later writers have frequently based their conclusions upon a narrow range of observations, confined to a limited portion of the year, and it is not strange that their conclusions were often untrustworthy. It is only when we dissect a number of specimens, covering *all* the seasons in which a bird is present with us, that we can form any really valuable conclusions as to the usefulness or obnoxiousness of any species. Among the most notable of recent investigations are those of Mr. B. H. Warren, of West Chester, Pa., whose contributions upon the food habits of birds, made to the Pennsylvania Board of Agriculture, are especially valu-

able. Based, as they are, upon careful analysis of the dissected birds, they are not mere theories, but are to be accepted as positive proofs of what he claims for the species examined. Mr. Warren's examinations into the food habits of our much-despised hawk family, show that the popular notion concerning them is almost entirely erroneous. For his purpose, Mr. Warren captured (by trapping) and dissected 244 hawks, mostly of the common kinds, and made a careful examination of the food found in each.

Of the Red-tailed Hawk (*Buteo borealis*), he examined one hundred and two specimens, and found the food of eighty-one chiefly mice and other smaller quadrupeds; nine had eaten chickens; three, quail; two, rabbits; one, ham-skin; one, part of a skunk; one, a gray squirrel; one, a red squirrel; three, snakes. These birds were captured mostly in winter and spring—the only part of the year when they are known to prey much upon domestic fowls. In the summer and autumn grasshoppers and small quadrupeds are their principal diet.

Of the Red-shouldered Hawk (*Buteo lineatus*), thirty-six specimens were examined, all captured in autumn, winter, and spring. Of these, twenty-three showed mice and other small quadrupeds, with a few insects; nine had eaten frogs and insects; two, snakes and frogs; the remaining two, small birds and orthoptera.

Of the Broad-winged Hawk (*Buteo pennsylvanicus*), twelve specimens were dissected; four had eaten mice; three, small birds; four, frogs; one, crawfish and insects.

Of the Sparrow Hawk (*Falco sparverius*), twenty-nine were dissected. Of these, fifteen had eaten mice and insects; six, grasshoppers; two, coleoptera and grasshoppers; two, meadow larks; four, English sparrows (*Passer domesticus*).

Of Cooper's Hawk (*Accipiter Cooperi*), twenty-seven birds were examined, of which fourteen had eaten chickens; five, small birds; two, quail; one, frogs; three, mice and insects; two, small quadrupeds.

Of the Sharp-shinned Hawk (*Accipiter fuscus*), fifteen specimens were opened; six showed small birds; three, quail; one, mice; four, young chickens; one, grasshoppers and beetles.

Of the Rough-legged hawk (*Archibuteo lagopus*, *Sancti-Johannis*), Mr. Warren examined nine specimens, and found the food to be exclusively field mice.

Of the Marsh hawk (*Circus Hudsonius*), eleven specimens were examined. Five revealed mice; two, small birds; three, frogs; one, grasshoppers and a young rabbit. Other hawks were examined, but not in sufficiently large numbers to prove any conclusions concerning their food.

Mr. Warren concludes from these experiments that, with the exception of Cooper's and the Sharp-shinned hawks, the *falconidae* are more useful than harmful, and that, because of their benefit in destroying insects and rodents, they should be protected by law. It should be remembered that the State of Pennsylvania pays a bounty for the destruction of hawks and owls, without any regard for the species destroyed. In the State of Kansas, of the species above named, we have the Red-tail, Sparrow, Marsh, and Cooper's hawks, rather common. The Rough-legged hawk is rather common in winter, and the Sharp-shinned in migration. Another large hawk, Swainson's, is abundant in summer.

The Red-tail is the largest of our hawks, and with Swainson's is rather slow of wing, and timid. They rarely approach the farm-house or attempt to carry off poultry. They are birds of the forest and prairie, and in midsummer feed almost exclusively upon insects. In early spring, when feeding their young, they destroy rabbits, squirrels, mice and gophers in large numbers.

Our smallest hawk—the Sparrow Hawk—comes about our houses without fear. It rarely attacks poultry, except when the chicks are quite small. It is doing the

country excellent service now in the destruction of the English sparrow, which it easily captures, and seems to prefer to any other food.

The Marsh Hawk feeds upon mice, rabbits and frogs, with a good proportion of insects. It is a medium-sized hawk, fond of flying close to the ground along marshes. Its color is bluish slate, but it can readily be known by the white rump or upper tail coverts.

The only hawks really injurious are Cooper's and the Sharp-shinned, but the latter is present for but a short period in migration. It is too small to carry away a chicken, but it strikes hard, and partially devours the victim where it falls. Cooper's hawk is larger, is nearly as bold, and in some sections does considerable damage. My own observation would lead me to the conclusion that these two hawks are not really very injurious, but I regard the results of actual dissection as of more value than the conclusions of the most faithful observer of the food-habits of birds.

In another paper, Mr. Warren has shown the results of a long series of examinations into the food of the Crow Blackbird (*Quiscalus purpurens*). The birds were taken during the several summer months.

In March, twenty-nine specimens were examined. They had eaten chiefly insects and seeds; in five corn was present, and in four wheat and oats were found. "All of these grains," says Mr. Warren, "were in connection with an excess of insect food."

April.—Thirty-three were examined. Food chiefly insects, but with a small amount of vegetable matter.

May.—Eighty-two examined. Food entirely insects, chiefly cut-worms.

June.—Forty-three examined. Showed generally insects; cut-worms in abundance; fruits and berries present, but to a very small extent.

July.—The twenty-four examined showed mainly insects; berries present to a limited amount.

August.—Twenty-three examined; showed chiefly insects, berries, and corn.

September.—Eighteen examined. Food: insects, berries, corn, and wild seeds.

October.—Three hundred and seventy-eight were examined. One hundred and eleven of these, taken from the 1st to the 10th of the month, showed the following results: Thirty, corn and coleoptera; twenty-seven, corn only; fifteen, grasshoppers; eleven, corn and seeds; eleven, corn and grasshoppers; seven, coleoptera; three, coleoptera and orthoptera (grasshoppers); three, wheat and coleoptera; two, wheat and corn; one, wheat; one, diptera.

"The remaining two hundred and sixty-seven birds were taken from the 10th to the end of the month, and their food was found to consist almost entirely of corn."

The Kansas Crow Blackbird is closely allied to the eastern form, differing slightly in plumage. Its food habits are undoubtedly identical with those of the species upon which Mr. Warren's report is based.

Mr. Warren's reports upon the food of the Robin and other common species are equally favorable to the birds, and strong arguments in favor of their protection.

Perhaps the results of investigations made by Prof. S. A. Forbes, of Illinois, have greater value to the horticulturists of this country. His papers in the *Bulletins of the State Museum of Natural History* bear evidences of careful work and an honest effort to find the truth. They all bear witness to the usefulness of birds in the orchard and on the farm.

Of especial interest is his paper showing the results of an examination of birds shot in an orchard in Tazewell county, Illinois. This orchard of forty-five acres of bearing apple trees had been invested by canker worms for about six years. The foliage had been eaten from nearly all the trees; some were dead, and others had been removed from the orchard. The orchard was notable for the number of species of birds to be found in it. On May 24, 1881, Mr. Forbes shot specimens of twenty-

four species, and examined carefully the food found in them. At a second visit, on May 20, 1882, he shot ninety-one birds, representing thirty-one species. It is needless to say that nearly all of these birds had partaken largely of the canker worms. The thrushes, including the Robin, Catbird and Brown Thrush, had eaten 96 per cent. of insect food, and none of them had partaken of vegetable matter of any kind whatever. The warblers, of which fifteen specimens were shot, had eaten about 65 per cent. of canker worms. The vireos had eaten 44 per cent. of canker worms. The Cedar Waxwing—the Cherry-bird of New York and Pennsylvania—had eaten 100 per cent. of canker worms. Mr. Forbes estimates that the flock of thirty of these birds seen in the orchard would eat 3,000 worms a day, or 90,000 in the month in which the caterpillar is exposed. The sparrow family, commonly recognized as seed-eaters, had in reality eaten only 7 per cent. of seeds, while canker worms formed forty per cent. of their food. Similar results came from the examination of other groups.

Mr. Forbes concludes that in the presence of an excess of insect food of any kind, birds will prey upon them, thus preventing an undue increase of any species, and saving much to those interested in the cultivation of the soil. Professor Aughey, of Nebraska, made similar examinations into the food habits of birds in the presence of the swarming Rocky Mountain locusts, several years ago. He concluded that they were especially useful in reducing the excess of insect life.

During a visit to Pennsylvania, in 1885, when the seventeen-year locusts were so abundant, I was surprised to see even the English sparrows abandoning the villages, and taking to the woods and hedges in pursuit of the fat cicadae. Here, in Kansas, I have vainly watched to find an English sparrow eat an insect. In the presence of the swarming maple worms of Manhattan, they have uniformly refused to eat any. Only two species of birds have I ever found preying upon this worm. They were the Blue Jay and the Yellow-billed Cuckoo. The latter seems to be rather effective in destroying them; but the jay feeds upon them only casually, and swallows them with a gulp, as though he did not at all relish them.

I am glad to be able to report that the United States Government has established a Division of Economic Ornithology in the Department of Agriculture at Washington. Appropriations have been made by Congress sufficient to pay for keeping and publishing records of the observations made by ornithologists throughout the Union. The times of migration and food habits of all our birds are to be carefully studied and accurately determined. At the head of the division is a prominent scientist, Dr. Merriam, who was chosen by the ornithologists themselves. The conclusions of the division will be made known from time to time by the publication of bulletins and reports. A special report upon the migrations of birds in the Mississippi valley is now almost ready for distribution. It was prepared by Prof. W. W. Cooke, of Minnesota, Dr. Otto Widman, of St. Louis, and the writer of this paper, and will show the results of observations by more than a hundred local observers, stationed in the valley, from the Gulf on the south to the boundary of British America on the north. While this report will be of greater interest to the ornithologist than to the horticulturist, it is to be followed by others, showing the food habits of the various species in the different sections of the country and seasons of the year. The leading ornithologists of the country are interested, and will aid in the work.

A special report upon the English sparrow will soon be published by the division. A circular letter was sent to the officers of every agricultural or horticultural association, and to many private individuals, in the United States, asking for information as to its presence, its abundance, its general habits, and for opinions as to its useful or obnoxious qualities. The replies to these circulars will be properly tabulated and

arranged for publication; and we hope that the English sparrow will be obliged to suffer the proper consequences of an impartial report.

I cannot give a full review of the work contemplated by this department. Its usefulness to the people of the United States will speedily be made manifest. Let all who can, encourage it by aiding in the collection of information.

One more important work is to be noticed, and will close this report. I refer to the work now inaugurated in this country for the protection of our song birds. The enemies of bird-life are legion. The egg-robber, in the shape of serpent, bird and boy; the sportsman, who shoots for the sake of trying his skill; the collector for scientific purposes; cats and other quadrupeds; storms;—indeed, the number of agencies for their destruction is legion. But the present craze for the use of skins and wings of birds in personal adornment is having a most marked effect in the diminution and almost total destruction of some species. The Baltimore oriole has almost disappeared from the vicinity of New York and Philadelphia. The number of skins exported is enormous; and it is estimated that from five to ten millions are sold annually by the milliners of America. In London, *one* auction store sold 760,000 bird skins in the four months ending April, 1885. Four hundred and four thousand of these came from America. Is it not high time that public sentiment should be aroused to save the innocents from such wanton slaughter?

The American Ornithologists' Union, the Humane Society, the Audubon Society (the latter organized expressly to protect the birds), are all working faithfully for the accomplishment of the object sought. Especially are their efforts directed toward the enlightenment of the public as to the true state of affairs. Efforts are also making for the enactment and enforcement of most rigid laws for bird protection in each of the States. It is to be hoped that the members of our State Horticultural Society will make efforts everywhere to build up a sentiment in favor of the birds. You are to be congratulated upon the outlook for an increased opportunity to know what are the true relations of bird-life to your horticultural interests. Surely the birds will receive your protection and care about your orchards and premises. You can well spare them a little from the berries, fruit, or grain, which they protect from your enemies—the insects.

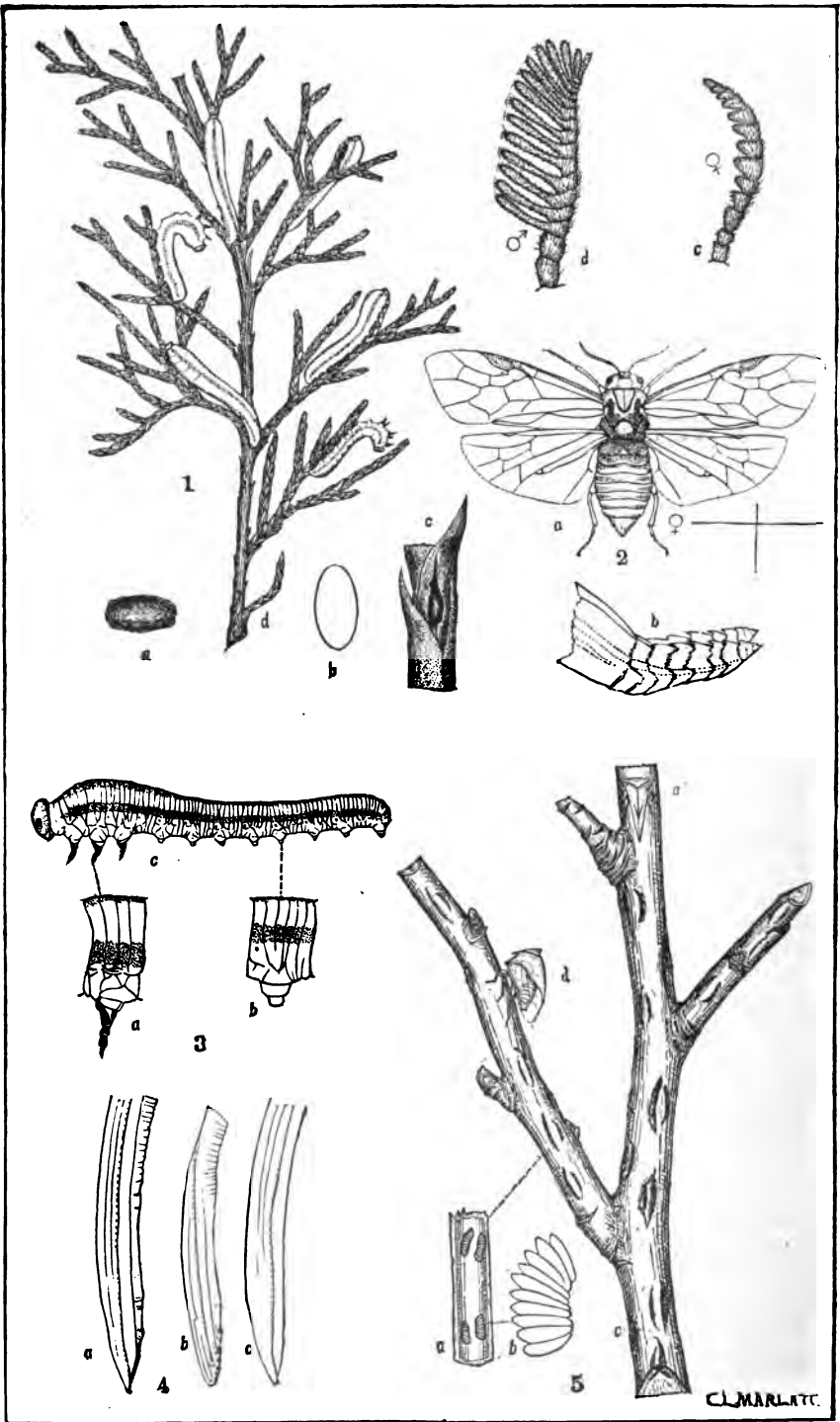
NOTES ON TWO IMPORTANT INJURIOUS INSECTS.

BY E. A. POPENOE, DEPARTMENT OF HORTICULTURE AND ENTOMOLOGY, STATE AGRICULTURAL COLLEGE.

THE RED CEDAR SAW-FLY.

(*Lophyrus* [*Monoctenus*] *juniperi* Marlatt.)

From the middle of April to near the middle of May, 1885, for the first, and again during the corresponding period of 1886, a species of saw-fly afterward described as above was taken in numbers by the use of the beating-net, from the branches of the red cedar (*Juniperus virginiana*), on the college grounds and elsewhere in the vicinity of Manhattan. The females were observed depositing eggs by means of their saw-like ovipositor under punctured leaves at or near the ends of the growing twigs, one egg upon a twig. The eggs, measuring about one-twenty-fifth of an inch in length, oval in form, and whitish in color, are placed under the scale-like leaf, the ovipositor



THE RED CEDAR SAW-FLY, AND THE BUFFALO TREE-HOPPER.

(Figs. 1, 2 and 3 refer to the Saw-Fly; Figs. 4 and 5 to the Tree-Hopper.)

of the fly being thrust through the leaf for the purpose, and lie in a direction parallel to the length of the leaf. They are at first concealed in the puncture or slit, but by the swelling of the egg, and by the shriveling of the deadened leaf, they in some cases become visible from without. The puncture in the leaf, being minute, is not readily detected at first, except by the slight roughening or powdered surface at the point pierced. Later the leaf becomes yellow and shrivels somewhat, rendering the eggs visible even in a somewhat rapid examination.

At the time of egg-laying both sexes are found upon the trees, or flying from one branch or tree to another. They are indisposed to flight on cool days or in early morning, but in the sun fly with ease. The females are less easily alarmed when at work, and may be approached closely and watched with a hand magnifier. When approached the flies were often seen to drop from their resting-place, taking wing before reaching the ground.

The first larvæ were observed on May 7, 1886, on the tips of twigs, and evidently just emerged from the egg. These fed on the tender leaves of the terminal growth of the twig. At this stage the larvæ were of a dull green, with the head brownish, two opposite, eyelike spots being black; the thoracic feet, black or black marked. The thoracic segments were about one-fifth greater in diameter than those following. No marked change in color occurred till the third moult, when there appeared a broad dorsal, and, on each side above the stigmata, a lateral line, of grayish black, extending from head to last segment. Alcoholic specimens of larvæ taken before the third moult show traces of this marking. No great change in color took place after the third moult, except the clearing of the dull greenish body color and the better definition of the lateral and dorsal lines. The larvæ were now feeding upon the twigs entire, beginning at the tip and eating downward.

On June 10th the first full-grown larva was observed, and shortly entered the soil of the breeding-cage where the larvæ were being reared. At this stage they measured 1 to $1\frac{1}{4}$ inches in length. Larvæ were observed upon trees on the grounds until the 15th of July, after which none could be found. A few days later an examination of the soil in the breeding-cage disclosed numerous small, oval, closely-felted, silken cocoons, the material entangling, on the outside of the outer layer of the cocoon, particles of the soil in which the cocoon was formed. Within this an inner layer was bright reddish, with nacreous reflections on the inner side. The cocoons averaged five-sixteenths of an inch in length, and were about half as wide as long. Within these cocoons the larvæ, much contracted, were still to be found when last examined (October 15th). The pupal stage has not been observed, and doubtless is only assumed toward the time for the reappearance of the fly.

The perfect flies, though of nearly the same size in the two sexes, differ markedly in some other characters. The male is polished black over the whole body, and the antennæ in this sex are beautifully feathered, as seen in the plate. (Fig. 2, *d*.) The female is honey-yellow, with black markings, as shown in Fig. 2, *a*, and her antennæ are plain, serrate, and slightly clavate. (Fig. 2, *c*.) This sex is further distinguished, as in all saw-flies, by the ovipositor, which is concealed, when not in use, in a longitudinal slit on the under side of the terminal half of the abdomen. This instrument is shown, magnified, in Fig. 2, *b*.

No thorough experiments looking to the destruction of this insect were made, but a preliminary attempt with a spray of kerosene in water resulted in the death of about twenty-five per cent. of the larvæ subjected to the spraying within twenty-four hours after the application of the insecticide. It is proposed to continue the investigation of this species next year, with the hope of learning its distribution, and the amount of injury accomplished by it, as well as to study means for its ready destruc-

tion, should this become necessary. Will our friends in the Society aid in this, by sending specimens of this insect in any of its stages, or of any insect which may resemble it, to the writer?

For careful observations upon the transformations of this insect, and for the accurate delineation of its stages in the plate accompanying, credit is due to my assistant, Mr. C. L. Marlatt.

THE MODE OF OVIPOSITION OF THE BUFFALO TREE-HOPPER.

For several years attention has been called to the work of an unrecognized insect upon the branches and twigs of several kinds of cultivated trees in the vicinity of Manhattan, specially to its work in a young apple orchard near the college, and upon the soft maple trees growing in the college grounds. At the most conspicuous stage, the work of the insect was evidenced by a great number of small, irregularly circular or oblong scars in the bark, crowding the upper sides of the twigs and branches down to those of three or four years' growth. The scars upon the bark of the older branches were much the largest and proportionally more spreading in the direction of the circumference of the branch, owing to the growth of the branch. Examination of these scars during autumn and winter, disclosed the presence, in twin slits under the bark, of two rows of eggs in the scars on the twigs, and remains of eggs in the scars next older, while in the oldest scars the slits formerly containing eggs were visible as dead spots in the sap-wood. The effect of these punctures in the bark and wood was shown in the unhealthy and unsymmetrical appearance of the twigs, and in the young apple trees mentioned, in the lack of vigor of the tree itself.

Our attempts to identify the insect by breeding from the eggs in twigs gathered during spring, and placed in moist soil in the breeding-cage, were unsuccessful, the eggs failing to hatch. Examination of the infested trees in early June showed most of the eggs hatched, though at the time the young insects were not discovered, nor did frequent examinations during summer furnish a clue to the agent in the injury. During the first week in September, however, the presence of the buffalo tree-hoppers (*Ceresa dubalus*) in great numbers on the trees, from which they flew with a buzzing sound when disturbed, directed attention to this insect as the probable author of the injurious punctures, and careful watching soon disclosed the females in the work of oviposition. Others were observed in the act, from time to time, as late as October 24th.

The following account of the operation of oviposition, collated from the notes of the season made by Mr. C. L. Marlatt, my assistant in entomology, are given as correcting the heretofore published descriptions of the egg-laying of this species:

Standing parallel to the twig, the female thrusts the ovipositor obliquely into the bark, and, working backward, cuts a slightly-curved slit. Beginning at the posterior end of the slit, the insect now thrusts the ovipositor its full length into the cambium between the bark and wood, and an egg is placed. The ovipositor is now drawn forward, a second egg is laid, and so on, until the anterior end of the slit is reached. A second slit is then made a little to one side, its concave side facing that of the slit first made, and a second row of eggs is laid. The number of eggs is usually from seven to twelve in each slit, and the entire operation requires about half an hour for its completion. In the completed wound it may be seen that the eggs in either row were introduced from the slit on the opposite side; a narrow line of bark is thus cut entirely loose from the wood beneath it, and soon dies, leaving on the growing twig an irregularly-circular dead spot as above mentioned.

The insects, in all stages, may be found sucking the juices of a great variety of

plants, not seeming to attack the apple specially. On account of their very general distribution, their shyness, and great activity, no satisfactory method of destruction has been so far found.

In the accompanying plate is shown the position of the insect at work, (Fig. 5, d, e), the scars on the bark when first made,* a portion of bark detached, showing the double row of eggs (a), with a magnified outline of a single egg-cluster (b). In Fig. 4, the ovipositor in its sheath (a), the naked instrument (b), and one of the two valves composing the sheath (c) are shown separately, much magnified.

REPORT OF COMMITTEE ON VEGETABLE GARDENING.

BY HENRY MANWARING, LAWRENCE.

The success of all gardening operations depends largely on preparatory measures, and the beginner in this pursuit should move cautiously, step by step, learning as he goes. All lands will be much benefited by liberal application of manure, which should be in a thoroughly decomposed state. The preparation should be thorough, by deep plowing and pulverizing, and if the plowing is done in fall and again in spring, just before planting begins, the best results will be realized. It should be borne in mind that a tender and excellent flavor in vegetables depends upon a rapid growth, and that the encouragement of a vigorous growth is the main point in gardening. The following list may be relied on as safe, and yielding a product of the highest excellence. It is arranged in alphabetical order and in their season:

Asparagus.—Conover's Colossal.

Beans.—For early: Snap, Golden Wax, Black Wax, Wardwell's Kidney Wax. The latter is a much larger and longer pod than the others, and is entirely stringless and of good quality—a strong grower, and stands the summer heat well. It is about as early as the Golden or Black Wax. For shelling: Large and small Lima. Plant all varieties early.

Beets.—Eclipse and Egyptian Turnip for extra early; Dewing's Improved Blood Turnip for second crop and winter use. Sow these varieties later in the season. The Eclipse is as early as the Egyptian, a round shape and of better quality. Sow as soon as the ground can be worked in the spring.

Cabbage.—Etamps and Henderson's Premier are about the same in season. Wakefield is the best early market variety. Henderson's Summer and All Seasons are the best second early. Late Flat Dutch, Excelsior, Early Deep Head, and Fotler's Brunswick, for winter use. Large Late Drumhead and Mammoth Marblehead are large, but the latter does not endure the intense heat as well as the other. Sow All Seasons, Deep Head and Excelsior later in season.

Cauliflower.—The Snowball has proven most desirable.

Carrots.—Early, Scarlet Short Horn, Half-long (Stump Rooter), Oxheart, or Guerande; Henderson's Intermediate, for general crop; for late, Danvers, and Long Orange.

Celery.—Henderson's White Plume is a self-bleacher and a dwarf variety, and is the best. Henderson's Half-dwarf and White Walnut are also desirable varieties. For tall-growing varieties, the Giant White Solid is the best.

*Those on the main branch drawn proportionally drawn too large.

Corn.—Cory's Sweet is the earliest, next Early Marblehead, and Early Narragansett. Both have amber-colored kernels, and the Early Minnesota a white kernel. Second early, Triumph, and Amber Cream. Late, Stowell's Evergreen, and Egyptian. The Early Marblehead has a short stalk, and bears large ears; is some earlier than the last two named.

Cucumbers.—Jersey's Earliest Improved, White Spine, Early Frame and Tailby's Hybrid are each early, though to be preferred in the order named. The latter is a cross between the White Spine and English Frame, yields a large product, and continues bearing longer than the Improved White Spine.

Egg Plant.—New York Improved, Kohl Kabi, Early White, and Purple Vienna.

Lettuce.—Black-seeded Simpson is the earliest variety; does not head. Salamander, Hanson, Golden Stone Head, Henderson's New York are headers; Henderson's New York forms the largest heads of any variety I have ever raised, producing heads that weighed four pounds each. All these varieties are free from any bitterness or unpleasant flavor; tender and crisp.

Muskmelons.—Early, the Hackensack; late, Montreal Market. These are both netted varieties.

Watermelons.—For extra early and quality, Icing; for main crop, Kolb's Gem and Mammoth Iron Clad, Sealy Bark, Cuban Queen, Gypsy.

Onions.—For sets the potato variety is the earliest; the Queen, Extra Early Red, and Early Red, are the earliest grown from seed; and for a general crop, the Globe and Kansas Multiplier; the Early Yellow Cracker is the earliest of the yellow varieties.

Parsnips.—Very early, the Early Turnip; general crop, Long Smooth or Yellow Crown.

Peas.—The Alaska is the earliest pea under cultivation, is about three days earlier than the New Yorker and American Wonder. For a succession for family and market, plant the American Wonder in season as needed. For late, Yorkshire Hero and Pride of Market.

Peppers.—Ruby King, Golden Dawn, for mild flavor, and Cayenne for strong flavor. They should be started in a hot-bed if wanted early.

Potatoes.—Early Ohio is the best early variety. The Early Maine and Lee's Favorite are favorites with some planters. Of the Boston and Chicago Market, the first is the best. Gem, Surprise and Beauty of Hebron have their admirers. These are all early varieties. Of the late varieties, the White Star is a good yielder, and excellent in quality. Mammoth Pearl, St. Patrick and Grange yield heavy crops, but are coarse in quality.

Radishes.—Extra early: Early Round Dark Red, Early White Turnip, and Early Scarlet Turnip. The French Breakfast and Wood's Early Frame, are good sorts. For winter, California Mammoth, White Winter. An early crop of radishes can be grown successfully, by running the seed drill along the top of early-potato rows, and matured for use before the potatoes interfere.

Squashes.—Early, White and Yellow Bush, Scalloped Bush, Summer Crookneck; autumn, Butman and Boston Marrow; winter, Hubbard.

Tomatoes.—Livingston's Beauty, Perfection, and Favorite.

Turnips.—Very early, Extra Early Purple-top Munich, Red-top Strap-leaf, White Strap-leaf. The above list is recommended for a family garden. It is always best to plant in long rows, which are far enough apart to permit their working with a horse-cultivator, thereby saving much hard labor.

TIME AND METHOD FOR PLANTING AND CULTURE.

Beans.—The early varieties should be planted the fore part of April, and the later varieties the first of May. This may be done in drills or in hills.

Cabbage and Cauliflowers.—For an early product, sow the seed early in February, in hot-beds; transplant a month later into cold-frames, for the purpose of hardening them for out-door exposure, and about the middle of April plant in rows about three feet apart. For winter use sow the seed in May, and transplant into rows as above named in June and July.

Carrots.—Sow the seed in rows as early as the earth can be prepared.

Celery.—Sow the seed in a cold-frame in April, and transplant to rows in July and August.

Corn.—For an early crop, plant as soon as the ground becomes sufficiently warm to germinate the seed, and at intervals thereafter as is desired for a continuous crop.

Cucumbers.—For an early crop, use the common berry-box, filled with light, rich earth, and in about the middle of March or first of April plant three or four seeds, place the boxes in a warm and sheltered place, and when danger of spring frost is past, transplant to open ground by breaking down the sides of the box and moving the ball of earth into places prepared for hills. By this method the soil is not broken from around the roots, and there will be no check to their growth. It is simple, and safer than the method sometimes practiced, of using small pieces of sod in place of boxes. Plants thus started will produce a crop a month earlier than can be obtained by planting seed in the garden.

Egg Plant.—Treat the same as recommended for cucumbers.

Kohl Rabi.—Plant the seed in well-prepared land as soon as it can be worked in the spring, in rows, and thin out the plants to six-inch spaces between.

Lettuce.—For extra early, sow seeds in hot-bed in January and February, and at intervals thereafter as desired.

Melons.—Treat the same as recommended for cucumbers, only do not plant as early by one month.

Onions and Peas.—Should be planted as early in the spring as possible. For peas, I have found no advantage in deep planting, as two or three inches is sufficient for a healthy plant-growth.

Peppers.—Sow the seed early in April, in a warm, sheltered place, and transplant to rows, by the middle or last of the month, about eighteen inches apart in the row.

Potatoes.—For an early crop, must be planted as soon as the danger of the ground freezing is past. For a late or winter crop, plant the last of May or first of June.

Radishes.—Sow as soon as frost has left the ground for early, add at intervals thereafter as desired.

Squashes.—For an early crop, plant the same as recommended for cucumbers. For late or winter uses, in May.

Tomatoes.—Plant seed in berry-boxes, in March, and treat them the same as recommended for cucumbers.

Turnips.—For an early crop, sow the seed as soon as the ground can be prepared; for fall and winter uses, from last of July till middle of August.

COUNTY FRUIT REPORTS FOR 1886.

[CIRCULAR No. 2, 1886.]

SECRETARY'S OFFICE, KANSAS STATE HORTICULTURAL SOCIETY, }
LAWRENCE, September 18, 1886.

DEAR SIR: The President of this Society instructs me to tender you the appointment of Vice President for your county for the year 1886, and respectfully requests you to accept and perform the duties of the office, as defined in the following article of the Constitution of the Society:

"ARTICLE VII. There shall be a Vice President annually appointed in each county in the State, whose duty it shall be to organize local horticultural societies in their respective counties whenever practicable, to report to each annual meeting on the general subject of horticulture, and to look after the interests of horticulture in their respective localities."

Article III of the Constitution was amended at the Thirteenth Annual Meeting, as follows:

"Any person who, under the appointment of the President, shall perform the duties of a County Vice President for one year shall be enrolled an ANNUAL MEMBER for that year, and, in consideration of such service for ten years, shall be enrolled a LIFE MEMBER, and entitled to all the privileges of such membership."

The following questions are suggested by this office as important for consideration in making up your report for the year 1886. Any other matter coming under your observation and of interest to the horticulturist should be included, and will be carefully considered.

ORCHARDS.

(Embracing Apple, Peach, Pear, and Plum.)

1. What was the condition of trees on March 1, 1886? Apple, cherry, peach, pear, plum.
2. What was the wood growth of 1886—light, medium, strong? Apple, cherry, peach, pear, plum.
3. What was the condition of trees on November 1, 1886? Apple, cherry, peach, pear, plum.
4. What per cent. of trees in good condition in 1884 have since failed, and to what do you attribute the cause? Apple, cherry, peach, pear, plum.
5. What per cent. of the spring planting has failed, and from what cause? Apple, cherry, peach, pear, plum.
6. From results of past years, what character of location and soil do you recommend as most successful for tree and product? Apple, cherry, peach, pear, plum.
7. Please name varieties most successful in your county in tree and fruit. *Summer*: Apple (3 to 5 varieties), cherry (1 to 2 varieties), peach (3 to 5 varieties), pear (3 to 5 varieties), plum (1 to 2 varieties). *Autumn*: Apple (3 to 5 varieties), peach (3 to 5 varieties), pear (3 to 5 varieties), plum (1 or more varieties). *Winter*: Apple (5 to 10 varieties), pear (2 to 3 varieties).
8. What per cent. of the apple crop of 1886 will be marketable?
9. What the average market price paid during the year? Apple, per bu.; cherry, per bu.; peach, per bu.; pear, per lb. or bu.; plum, per bu.
10. Considering the value of land, cost of trees, and necessary expense in planting and culture, are orchards a profitable investment for market or family purposes, or do they promise to be in the future? Apple, cherry, peach, pear, plum.
11. Was the planting in the spring of 1886 in excess of that of the preceding year? Apple, cherry, peach, pear, plum.

DISEASES.

12. What diseases have appeared in orchards the present year? If any, to what extent damaging? Apple, cherry, peach, pear, plum.

INSECTS.

13. What species have been damaging to tree and fruit? Apple, cherry, peach, pear, plum.
14. Have any of the following species been more or less numerous than in preceding years? Codlin moth (apple worm), plum curculio (plum worm), tree cricket, round-headed apple-tree borer, flat-headed apple-tree borer, peach-tree borer, fall web-worm, handmaid moth, canker worm.

VINEYARDS.

15. What per cent. of a full crop matured, and what its quality compared with preceding years?

VARIETIES.

(Report by names in the order of success.)

16. What varieties of black grapes are most successful? Of red grapes? Of white grapes?
 17. Which is your best market variety? Family variety?
 18. What was the average price per pound paid in your market the present year?
 19. On what location, soil, and under what treatment have the best results been obtained during the last five years?
 20. Name a list of early, medium, and late varieties to be preferred.

DISEASES.

21. Has "rot" been prevalent in your county during the past and present years? If so, what per cent. was injured?
 22. Has mildew attacked the leaf? To what extent prevalent?
 23. Can you recommend any reliable remedy or prevention for either the rot or mildew?

SMALL FRUITS.

24. What was the condition of plantations on March 1, 1886? Blackberry, currant, gooseberry, raspberry, strawberry.
 25. What the conditions on November 1, 1886? Blackberry, currant, gooseberry, raspberry, strawberry.
 26. On what location and soil do they produce the best results? Blackberry, currant, gooseberry, raspberry, strawberry.
 27. What the average market price per crate, of 24 boxes each, during the season? Blackberry, currant, gooseberry, raspberry, strawberry.
 28. What the estimated yield per acre? Blackberry, currant, gooseberry, raspberry, strawberry.
 29. Please give a list of the most successful varieties in your county. Blackberry—early, medium, late; currant—red, white; gooseberry; raspberry—early, medium, late; strawberry—early, medium, late.

MISCELLANEOUS.

RUSSIAN FRUITS—APPLE.

30. What was the condition on March 1, 1886?
 31. What on November 1, 1886?
 32. What varieties fruited successfully the present season? Summer, autumn, winter.
 33. Are the trees any more hardy in winter or summer than the kinds common to the Western States?

APRICOT.

34. What was the condition of trees on March 1, 1886?
 35. What on November 1, 1886?
 36. What is the age of the oldest-planted trees in the county?
 37. Did they bloom and fruit the present year? If not, to what do you attribute the failure?
 38. Is the acreage of fruit-planting annually increasing in your county?
 39. Has the general confidence of your people in horticultural work lessened during the present and preceding year?
 40. Are farmers generally planting fruits for home uses?

41. Please fill out, sign your name, and return promptly by November 1, 1886.

Yours, very truly,

G. C. BRACKETT, *Secretary*.

NORTHERN DISTRICT.

ATCHISON COUNTY.—By HARVEY L. BROWN, INVERMAY.

(North half.)

Orchards: On March 1st, 1886, the condition of all classes of trees was good, excepting the peach; mostly all the old ones were dead. On November 1st, 1886, the condition of all classes of trees was fair. The wood growth of all classes was medium, excepting the cherry, which was light.

Failures since 1884 were quite heavy, caused by blight and the following extreme cold winter.

Location: High land, with a deep, sandy loam, has been the most successful for all classes.

The following is a list of the most successful varieties in this county in tree and fruit: Apple—Summer, Early Harvest, Red Astrachan, Red June; autumn, Maiden's Blush, Jonathan, Rambo; winter, Ben Davis, Grimes's Golden, Smith's Cider, Winesap, Missouri Pippin, Rawle's Genet. Cherry, Common Morello, Early Richmond; pear, Bartlett, Kieffer; plum, Wild Goose.

Of the apple crop of 1886, 25 per cent. was marketable. The following is the average market price paid per bushel during the year: Apple 30c., cherry \$1.50, pear \$2.50, plum \$3.

Considering the value of land, cost of trees, and necessary expense of planting and culture, the apple and cherry are profitable at present; plum, certain varieties profitable.

The planting in the spring of 1886 was not as good as that of the preceding year.

Diseases: The apple and pear were damaged slightly by blight.

Insects: The borer and codlin moth damaged the apple and pear, but no more than in the preceding years. The cherry worm injured the cherry, and the curculio injured the plum more than in the preceding years.

Vineyards: Of the grape crop, 50 to 75 per cent. matured, and was of very fine quality. Of the black varieties, the Concord is the most successful; of the white, the Martha; of the red, the Delaware; the Concord is the best market variety, the Delaware the best for family use. The average price paid per pound in this market, 2½c. Vineyards on a medium between a high and low elevation, with a deep, sandy loam soil, the vines trained on wire trellises, well trimmed and cleanly cultivated, have produced the best results in the past five years. The varieties preferred are as follows: Early, Hartford Prolific; medium, Delaware; late, Concord. The rot injured the grape crop last year 50 per cent., this year about 25 per cent.

Small Fruits: On March 1st, 1886, the condition of the blackberry, currant and gooseberry was medium, raspberry and strawberry good. On November 1st, 1886, the condition of all classes was fair, excepting the gooseberry, which was poor. The blackberry produces the best results on a southeastern slope, second bottom, and a sandy loam; the currant on a medium elevation, protected from the sun and south winds. The following is the average market price paid per crate of twenty-four boxes each during the season: Blackberry and currant \$2.40, gooseberry, raspberry and strawberry \$2. The estimated yield of all classes per acre was from 2,500 to 3,000 quarts. The following is a list of the most successful varieties in this county: Blackberry, early, Early Harvest; medium, Kittatinny or Snyder; late, Lawton; currant, Red Dutch, Utah, and White Grape; gooseberry, Houghton, Smith's; raspberry, early, Doolittle, Davison's Thornless; medium, Gregg, Mammoth Cluster, Turner; strawberry, early, Crystal City; medium, Crescent, Charles Downing, Bidwell, Sharpless; late, Glendale, Kentucky.

Russian Fruits: On March 1st, 1886, the apple was in good condition; on November 1st, 1886, medium. Do not think the tree any hardier in winter or summer than other kinds common in the Western States. The age of the oldest planted trees in this county is seven years. They bloomed the present year.

The acreage of fruit-planting, as a general thing, is annually increasing. Most of the farmers are planting fruits for general home uses.

(Central portion.—By Thos. F. Cook, Monrovia.)

Orchards: On March 1st, 1886, the condition of apple, cherry and plum trees was good; pear, medium; and peach very poor. The condition on November 1st, 1886,

was good, excepting the peach and pear, which was only medium. The wood growth of 1886 was medium of all classes.

The failures during 1885 were very light of all classes, and caused by negligence, excepting of the peach, which was severely injured by the extreme cold winter. Pear suffered from blight. Of the spring planting, very few failures occurred.

Location: A northeastern slope, on good strong soil, that would produce a good corn crop, has been most successful for all classes.

The following is a list of the most successful varieties in this county in tree and fruit: Apple—Summer, Early Harvest, Red Astrachan, Oldenburg; autumn, Maiden's Blush, Fameuse, Jonathan; winter, Ben Davis, Missouri Pippin, Winesap, Willow Twig, Limber Twig. Cherry, Early Richmond; plum, Wild Goose.

Of the apple crop of 1886, 50 per cent. was marketable. The average market price paid per bushel during the year was: Apple 30c., cherry \$1, pear \$2, plum \$1.

Considering the value of land, cost of trees, and necessary expense in planting and culture, the apple and cherry are profitable, but the others are not.

The planting of 1886 was about the same in extent as that of the preceding year.

No diseases have appeared in orchards during the present year.

Insects: The codlin moth has been damaging to the apple, but was not as numerous as in preceding years. The curculio has damaged the plum to about the same extent as in years before.

Vineyards: Of the grape crop, 75 per cent. matured, and was of good quality. Of the black varieties, the Concord has been the most successful; it is also the best family and market variety. The average price paid per pound in this market was 3c. A high location has produced the best results during the past five years. The Concord is the only variety raised to any extent in this county. The crop has not been materially injured during the past and present years by rot, and mildew has not attacked the leaf.

Small Fruits: On March 1st and on November 1st, 1886, the condition of all plantations was good. The blackberry, in this county, produces the best results along the river bluffs; the currant, on high prairies. The following is the average market price per crate of twenty-four boxes each during the season: Blackberry, raspberry, strawberry, and currants \$2.40, gooseberry \$1.20. One hundred crates per acre was the estimated yield of all classes excepting the blackberry, which was about fifty. The most successful varieties of the blackberry were the Kittatinny for early and Snyder for late.

Russian Fruits: The condition of the apple on March 1st and November 1st, 1886, was good. The Oldenburg and Red Astrachan fruited successfully the present year. These trees have not been sufficiently tested yet to determine whether they are any more hardy in winter or summer than the kinds common to the Western States.

The acreage of fruit-planting has annually increased in this county, and farmers are planting fruits for general home uses.

(South half.—By Hiram J. Ward, Farmington.)

Orchards: On March 1st, 1886, the condition of apple, cherry and plum was good; pear, medium; peach, largely dead. On November 1st, 1886, the condition of all classes was good; the wood growth of all classes was good in 1886.

The per cent. of failures since 1884 have been as follows: Apple, forty per cent. dead, cause attributed to too close planting; peach, on account of extreme cold winter.

A northern slope, having a clay loam, is the most successful for the apple, and for all other classes a high, dry land, with good soil.

The following is a list of the most successful varieties in this county, in tree and

fruit: Apple—Summer, Red June, Early Harvest, Red Astrachan, Maiden's Blush, Golden Sweet; autumn, Westfield Seek-no-further, Jonathan, Rambo, Dominic; winter, Winesap, Ben. Davis, White Winter Pearmain, Rawle's Genet, Lawver, Baldwin. Cherry, Early Richmond, May Duke; pear, Bartlett; plum, Wild Goose.

Of the apple crop in 1886, about eighty per cent. was marketable. The average market price paid per bushel during the year was: For apple 50c., cherry \$2, plum \$2.

Considering the value of land, cost of trees, necessary expense of planting and culture, the apple, cherry, pear and plum are profitable, but the peach is not.

Diseases: In orchards no disease has appeared this year, excepting a little blight on the apple.

Insects: No species have been injurious, excepting the apple-tree borers.

Vineyards: The crop was a full one, and matured in the best condition. The Pocklington is the most successful white grape, the Concord the best market and family grape. The average price paid per pound in this market this year was 3c. An upland, sandy, gravelly soil, a little rolling, produced the best results during the past five years. The grape crop of the past and present years was injured about 5 per cent. by rot; mildew has not attacked the leaf so far.

Small Fruits: On March 1st, 1886, the condition of the blackberry, currant and gooseberry was poor, raspberry good, strawberry medium. On November 1st, 1886, the condition of the blackberry and currant was medium, gooseberry and strawberry poor, raspberry good. All small fruits succeed best on a southern slope and cleared-up brush land. The following is the average market price per crate of twenty-four boxes each during the season: Blackberry \$1.70, currant \$2.40, gooseberry \$1.20, raspberry \$3.60, strawberry \$2.10. The following is a list of the varieties most successful in this county: Blackberry, Kittatinny for early, Snyder for late; currant, Utah Red; gooseberry, English varieties; raspberry, common blackcap; strawberry, Crescent, Col. Cheney, Wilson, and Captain Jack.

The acreage of fruit-planting is annually increasing in this county, and farmers are planting fruits for general home uses.

BROWN COUNTY.—By JOHN M. REID, MORRILL.

(North half.)

Orchards: On March 1st, 1886, the condition of trees of all classes was good, excepting the peach, which had been frozen to death. On November 1st, 1886, the condition of all classes was good, excepting the pear, which was fair. The wood growth of 1886 was strong of all classes, excepting the peach and pear, which was medium.

The apple and plum blighted in 1884, and about 90 per cent. of the peach trees failed from the injury of the extreme cold winters following. Of the spring planting, 20 per cent. of the apple, 25 per cent. of the cherry, 50 per cent. of the pear, 10 per cent. of the plum failed, caused by drouth.

The best results have been produced with the apple on sandy soil having a north or northeastern slope; cherry, clayey, with limestone base on an eastern slope; pear, near the house, well sheltered; plum, in the poultry yard. The following is a list of the most successful varieties in this county in tree and fruit: Apple—Summer, Early Harvest, Cooper's Early [White], Red Astrachan; autumn, Maiden's Blush, Jonathan, Rambo; winter, Ben Davis, Winesap, Missouri Pippin, Rawle's Genet. Cherry, Early Richmond, Black Tartarian; pear, Bartlett.

In 1886, 50 per cent. of the apple crop was marketable. The average market price paid for the apple during the year was 40c. per bushel. Considering the value

of land and cost of trees, and necessary expense in planting and culture, the apple, cherry and plum are very profitable, but other classes are not.

The planting in the spring of 1886 was in excess of that of the preceding year.

Insects: The codlin moth infested the apple, the louse the cherry, and the borers the plum tree. The codlin moth, tree cricket, round-headed apple-tree borer and peach-tree borer were more numerous than in preceding years.

Vineyards: The early grape crop was well matured and of good quality, but the late was nearly all unmarketable. Of the black varieties, the Concord was the most successful; of the red, the Jefferson; of the white, the Goethe. The Concord is the best market variety; the Salem the best family variety. The average price per pound paid in this market this year was 4c. The following is a preferred list of early, medium and late varieties: Hartford [Prolific], Moore's [Early], Concord, Martha, Goethe, Salem, and Agawam. Rot has not been prevalent in this county during the past and present years, nor has the mildew.

Small Fruits: On March 1st and November 1st, 1886, the condition of all classes was good. A sandy loam produces the best results with all classes. The average market price paid per crate of twenty-four boxes each was, Blackberry, \$2, raspberry \$2.40. The following is a list of the most successful varieties in this county: Blackberry, early, Early Harvest, Kittatinny; medium, Taylor; late, Lawton, and Snyder; raspberry, early, Souhegan; late, Gregg.

Russian Apples: The age of the oldest planted trees in this county is twenty years; they bloomed and fruited the present year.

The acreage of fruit-planting is annually increasing, and the farmers are planting fruit as a general thing for home use.

(South half.—By R. C. Chase, Hiawatha.)

Orchards: On March 1st, 1886, the pear and plum were in good condition, but the apple, cherry and peach were more or less injured by the extremely cold winter. On November 1st, 1886, all classes were in a good condition excepting the peach, which was dead to some extent. The wood growth of 1886 was strong of the apple, pear and plum, cherry medium, peach sickly.

The per cent. of failures during 1885 was as follows: Apple, about 10 per cent., caused by the severe freezing of varieties not adapted to the climate; cherry, 5 per cent.; peach, 50 per cent., caused by the severe winter; plum, not more than 20 per cent., caused by working on peach roots; pear, about 25 per cent., caused by blight.

Failures in the spring planting: Of the apple and cherry, 25 per cent., caused by dry weather and neglect; peach, 50 per cent., lack of vitality in tree, and neglect; pear, 20 per cent., dry weather, and want of cultivation and care.

Location: From the apple and cherry the best results have been obtained on uplands, well protected by heavy wind-breaks; the pear and plum on a clay loam well sodded.

The following varieties are the most successful in this county in tree and fruit: Apple—Summer Early Harvest, Carolina, June, Cooper's Early [White]; autumn, Maiden's Blush, Fameuse, Rambo, Fall Wine, Jonathan; winter, Ben Davis, Wine-sap, Missouri Pippin, Rawle's Genet, Gilpin, Smith's Cider, Rome Beauty, White Winter Pearmain, Grimes's Golden, Dominie; cherry, Early Richmond, May Duke, Governor Wood; peach, Alexander, Crawford's Early, Beatrice, Allen's October, Crawford's Late, Stump the World; pear, Seckel, Lawrence; plum, Miner.

Fifty per cent. of the apple crop in 1886 was marketable. The average market price paid for the different classes of fruits was: Apples 35c. per bushel, cherries \$3, pears \$3, plums \$2.

Considering the value of land, cost of trees, and necessary expense of planting and culture, the apple, cherry, and plum are profitable, but other classes are not.

The planting of the cherry and plum in the spring of 1886 exceeded that of the preceding year, but of others did not.

Insects: The codlin moth has been more injurious to the apple the present year than in the preceding years; the curculio has not damaged the plum as much the present year as it has years before.

Vineyards: Of the grape crop, this year, 60 per cent. matured, but it was poor in quality. Of the black varieties, the Concord, Champion and Clinton are the most successful; of the red, the Agawam and Delaware; of the white, the Martha and Niagara. The average price paid per pound in this market was 2c. Vineyards have produced the best results on a well-exposed upland soil, and where pruned heavily the last of February. Neither rot nor mildew has been prevalent.

Small Fruits: On March 1st, 1886, all plantations were in excellent condition, excepting the raspberry, which was badly winter-killed. On November 1st, 1886, all plantations were in a good condition, excepting the raspberry, which was poor. Blackberries have produced best results on the uplands and where shaded well; currant and gooseberry do the best on common prairie soil, protected from the hot south winds. The following is the average market price paid per crate of twenty-four boxes each during the season: Blackberry and currant \$2.40, gooseberry \$1.20, raspberry \$3, strawberry \$2. The estimated yield per acre was as follows: Blackberry 45 bushels, raspberry 10 bushels, strawberry 50 bushels. The following is a list of the most successful varieties in this county: Blackberry, medium, Snyder, Kittatinny; currant, Red Dutch, Red Cherry, Fay's Prolific, White Dutch, and White Grape; gooseberry, Houghton; raspberry, early, Miami, Turner; late, Gregg; strawberry, early, Wilson, Sharpless; medium, Glendale, Crescent, Capt. Jack.

Russian Fruits: Of the apple, the Red Astrachan and Oldenburg fruited the most successfully the present year.

The oldest planted trees in this county are about twenty years old. They bloomed and fruited the present season, but the fruit did not compare favorably with that of the preceding season.

The acreage of fruit-planting is annually increasing in this county. The farmers are planting fruits for general home uses.

CLAY COUNTY.—By A. R. KEELER, CLAY CENTER.

Orchards: On March 1st and November 1st, 1886, the condition of all classes of trees was good, excepting the peach, which was poor. The wood growth of 1886 of the apple, cherry and plum was strong, peach and pear medium. The failures of trees since 1884 were not heavy, and were caused by hot, dry weather in July and August.

The best results from orchards have been produced from a black loam and clay subsoil on an elevated eastern slope.

The following are the most successful varieties in this county in tree and fruit: Apple—Summer, Early Harvest, Carolina, June, Cooper's Early [White]; autumn, Maiden's Blush, Rome Beauty, Red Astrachan; winter, Missouri Pippin, Winesap, Jonathan, Ben Davis, Willow Twig, Red Winter Pearmain.

Of the apple crop in 1886, about 75 per cent. was marketable. The average market price paid per bushel during the present year was for apple \$1, cherry \$3.20, pear \$2.50.

Considering the value of land, cost of trees, and necessary expense in planting and culture, orchards of all classes are more profitable than raising grain.

The spring planting of 1886 was about as good as that of the preceding year.

Insects: The codlin moth has been more numerous the past year than in preceding ones; the fall web-worm has made its appearance.

Vineyards: About 80 per cent. of the crop matured, and was excellent in quality. The Concord is the most successful, and is the best market and family variety. The average price paid per pound in this market the present year was 4c. Mildew has attacked the leaf but lightly.

Small Fruits: On March 1st, 1886, the condition of all classes was very good, excepting the blackberry, which was very bad. On November 1st, 1886, the condition of all classes was very good, excepting the strawberry and blackberry, which were badly sun-scalded. Strawberries sold at an average of \$2.40 per crate of twenty-four boxes each. The most successful currant in this county is the Red Dutch; strawberry, Wilson.

Russian Fruits: The Red Astrachan fruited successfully the present year, but it is no more hardy in winter or summer than the kinds common to the Western States.

The acreage of fruit planting is annually increasing, and the confidence of our people is increasing in horticultural work in the county; farmers are planting fruits for general home purposes.

CLOUD COUNTY.—BY C. B. HAMMOND, CONCORDIA.

(North half.)

Orchards: On March 1st and November 1st, 1886, trees of all classes were in good condition. The wood growth of 1886 of apple, plum and cherry was strong; pear, light.

The failures which occurred in spring planting of 1886 were unusually heavy, owing to using shipped-in stock, which was in poor condition.

Location and Soil: All classes, both the tree and fruit, do best when grown on a rich soil and on a northern slope.

The following is a list of varieties most successful in this county: Apple—Summer, Carolina June, Red Astrachan, Oldenburg, Early Harvest; autumn, Maiden's Blush, Rambo, Cooper's Early [White], Fall Wine; winter, Missouri Pippin, Ben Davis, Rawle's Genet, Jonathan, Winesap, Lawver, White Winter Pearmain. Cherry, Early Richmond, May Duke, Montmorency; pear, Bartlett, Seckel; plum, Wild Goose, Miner, Weaver.

In 1886, ninety per cent. of the apple crop was salable. The average market price paid per bushel this season was as follows: Apple \$1, cherry \$3.25.

Considering the value of land, cost of trees, and necessary expense of planting and culture, orchards of all classes are profitable.

Insects: The following species have been prevalent: Flat-headed borer, fall web-worm, curculio. The peach-tree borer is increasing in number.

Vineyards: The grape crop this year was above medium in quantity and quality. Of black grapes, the Concord is the most successful; red, the Delaware. The Concord is the best for market and family. The average market price paid per pound was 10c. Vineyards do best on a northern slope and a rich sandy soil, well cultivated or mulched, and when given a heavy spring pruning.

Small Fruits: On March 1st, and November 1st, 1886, all plantations were in a good condition. Location and soil: The currant does best on north side of a hedge or stone wall, protected from the south winds, and on a clay soil. Gooseberry on a sandy loam. The blackberry yielded at the rate of 300 bushels of fruit per acre this season. The following are the most successful varieties in this county: Blackberry, Snyder; currant, Red Dutch, White Grape; gooseberry, Downing.

Russian Fruits: Apple—On March 1st, and November 1st, 1886, the trees were in

a good condition. The Russian varieties will doubtless be of great value to the West, as they have been very hardy, and appear to be healthy.

The acreage of fruit-planting is annually increasing in this county, and the general confidence of our people in the work of horticulture has greatly increased. Farmers are planting fruits for home uses.

(South half.—By Van E. Butler, Delphos.)

Orchards: On March 1st, 1886, trees of all classes were in a good condition, excepting the peach, which was injured by the past winter. On November 1st, 1886, trees of all classes were in a good condition.

The per cent. of failures since 1884 are as follows: Of the apple, 2 per cent., caused by blight; cherry, sweet varieties, 50 per cent.; peach, 50 per cent., caused by extreme cold and borers. Per cent. of failures in the spring planting: Apple, not more than 20 per cent., caused by neglect, using inferior stock, and drouth; cherry, pear and plum, caused by neglect.

Location and Soil: The apple and cherry produce best results on second bottom, dark sandy loam, having a northeastern slope; peach does the best on high lands, with a light sandy loam; pear, on second bottom, on a sandy loam.

The following varieties are the most successful in this county in tree and fruit: Apple—Summer, Early Harvest, Lowell, Carolina June, Oldenburg; autumn, Maiden's Blush, Chenango; winter, Ben Davis, Grimes's Golden, Missouri Pippin, Willow Twig, Rawle's Genet, Winesap, Rambo, Fameuse. Cherry, Early Richmond, Montmorency; peach, Crawford's Early, Alexander; pear, Clapp's Favorite, Bartlett, Flemish Beauty, Winter Nelis; plum, Wild Goose, Miner.

The crop of apples in 1886 yielded about 75 per cent. of marketable fruit. The following are average market prices paid per bushel in our market during the year: Apple \$1, cherry \$2.50, peach \$2, plum \$3.20.

Considering the value of land, cost of trees, and necessary expense of planting and culture, orchards of all classes excepting the peach are profitable.

Insects: The codlin moth and borers have been injurious to the fruit and the tree of the apple. They are more numerous than in preceding years.

Vineyards: The grape matured 80 per cent. of a crop the present season, which was of good quality. The following varieties are the most successful: Black, Concord; red, Dracut Amber, Delaware; white, Martha. The Concord is the best for market purposes, the Dracut Amber, Delaware and Martha for family use. Vineyard location: Vineyards produce best result on second bottom and a black sandy loam, and when trellised on wires. The following varieties are preferred: Concord, Dracut Amber, and Ives.

Small Fruits: On March 1st, 1886, plantations of all classes were in a good condition excepting the blackberry, which was badly broken down by the snow. On November 1st, 1886, plantations of all classes were in a good condition. Blackberry and raspberry succeed best on lowland and rich black loam. The average market price paid per crate of twenty-four boxes each in this market: Blackberry and raspberry \$3, gooseberry \$2, strawberry \$3.40. Estimated yield of product per acre: Raspberry 25 bushels, strawberry 80 bushels. The following varieties are the most successful in this county: Blackberry, early, Kittatinny; late, Snyder; gooseberry, Houghton; raspberry, medium, Gregg, Cuthbert.

Russian Fruits: The Red Astrachan and Oldenburg are the only varieties of apples in bearing. Apricot trees: On March 1st, 1886, the trees were badly winter-killed. On November 1st, 1886, they were in a good condition, but did not bloom.

The acreage of fruit-planting is annually increasing in this county, and the general confidence of our people in the work of horticulture has not lessened during the past and present years. Farmers are planting fruits for their home use.

DAVIS COUNTY.—BY NEWELL TRAFTON, MILFORD.

Orchards: On March 1st, 1886, the condition of all classes of trees was good, excepting the peach, which was rather poor. On November 1st, 1886, the condition of trees was good of all classes excepting the apple and peach. The wood growth of 1886 was medium of the apple and pear; cherry, peach and plum light.

The per cent. of failure since 1884 was of the apple, cherry and plum about 20 per cent., caused by neglect and drouth; peach 50 per cent. and pear 10 per cent., caused by extreme cold weather and drouth. Failures in the spring planting of apple, peach and pear, fully 50 per cent., caused by drouth, extreme cold and heat; cherry, 75 per cent., caused by neglect.

The best results have been produced from lands having a northern or northeastern exposure, having a sandy loam. The most successful varieties in this county in tree and fruit are: Apple—Summer, Early Harvest, Carolina June; autumn, Oldenburg, Chenango, Lowell, Autumn Strawberry, Jonathan, Gramar Pearmain; winter, Wine-sap, Missouri Pippin, Rawle's Genet, Ben Davis, Willow Twig. Pear, Clapp's Favorite, Bartlett, Lawrence, Flemish Beauty, Edmonds, and Vicar; cherry, Early Richmond; peach, Large Early York, Alexander, Heath Cling, Old Mixon Cling.

Of the apple crop of 1886, 10 per cent. was marketable. The average market price paid per bushel was: Apples 75c., cherry \$3, pear \$2.

Considering the value of land, cost of trees, and necessary expense of planting and culture, all classes of orchards are profitable excepting the peach.

The condition of the spring planting of 1886 was about the same as in preceding years.

Diseases: The only disease which occurred in this county the present year was the apple-tree blight, which varied according to locality in injury.

Insects: The codlin moth was more injurious to the apple than in preceding years. The tree cricket, flat-headed apple-tree borer, peach-tree borer, fall web-worm and canker worm have been less numerous than in preceding years.

Vineyards: Of the grape crop about 50 per cent. matured, and was good in quality. The most successful black varieties are the Concord and Clinton; of the red varieties, the Dracut Amber; of the white, the Goethe and Lady. The Concord and Goethe are the best market and family varieties. The average price per pound paid in this market by buyers was 5c. The best results have been produced in vineyards planted on an east and southern slope, trained on wires, and closely pruned, and given good cultivation. The following is a list of the early, medium and late varieties preferred: Delaware, Dracut Amber, Lady, Concord, Worden, Goethe. There has been very little damage to the crops from the rot.

Small Fruits: On March 1st and November 1st, 1886, the condition of plantations of all classes was good, excepting the blackberry, which was quite poor. The best results have been obtained from the blackberry when planted on a north and northwestern slope having a black, gravelly soil; currant, in a shaded place on a clay soil base; gooseberry and raspberry on a southern slope, if protected by wind-breaks on the south. The following is an average market price paid per crate of twenty-four boxes each during the season: Blackberry \$3.50, raspberry \$3, strawberry \$2.50. The estimated average yield per acre was about seventy-five bushels. The following is a list of the most successful varieties in this county: Blackberry, early, Kittatinny, medium, Lawton, late, Snyder; currant, Red Dutch, White Dutch; gooseberry, Houghton; raspberry, early, Souhegan, Tyler, late, McCormick's, Shaffer's [Colossal]; strawberry, early, Chas. Downing, medium, Crescent, Wilson.

Russian Fruits: On March 1st and November 1st, 1886, the trees were in a fine condition. The Oldenburg and Alexander fruited successfully the present year. They are no more hardy than the kinds common in the Western States.

The acreage of fruit-planting is annually increasing in this county; the general confidence of our people has not lessened in the work of horticulture, excepting in the peach; the farmers are planting fruit generally for their home use.

DICKINSON COUNTY.—By J. W. ROBSON, CHEEVER.

(*North half.*)

Orchards: On March 1st, 1886, the condition of all classes of trees was good, excepting the peach, which was very poor. On November 1st, 1886, their condition was good. The wood growth of 1886 of the apple and pear was strong, cherry and plum light, peach strong.

The per cent. of failures since 1884 has been light, caused by drouth and extreme cold winters. Of the spring planting, failures were light of apple and peach, caused by continuous dry weather, and heavy of other classes.

Location: Any kind will answer except low bottom soil, and the presentation is not of so much importance as the selection of the best and most profitable varieties of fruit to plant.

The most successful varieties in this county in tree and fruit are: Apple, summer, Carolina June, Early Harvest, Cooper's Early [White], Early Pennock, Keswick Codlin; autumn, Maiden's Blush, Jonathan, Dominie, Fulton, Fallawater, Ribston; winter, Winesap, Rawle's Genet, Missouri Pippin, Ben Davis, Willow Twig, Gilpin, Major. Cherry, Early Richmond, English Morello; pear, Osband's Summer, Clapp's Favorite, Flemish Beauty, Louise Bonne de Jersey, Seckel.

Of the apple crop of 1886, 30 per cent. of the crop was marketable, and this was far below the average of last year, in size and color. The average market price paid per bushel during the year: Apples 80c. to \$1, cherry \$3, pear \$4, plum \$2.

Considering the value of land, cost of trees, and necessary expense in planting and culture, an orchard is the best paying investment on a farm. The doubters and sneerers of the 70th decade have just got their eyes opened to this fact. He who laughs last, laughs loudest, heartiest and best.

The spring planting of 1886 was less in extent than that of the preceding year.

Insects: The handmaid moth has been damaging to the tree, the tree cricket to the fruit, but the former are not so numerous, and the latter are more numerous than of the preceding years. The plum curculio damaged the fruit, but is less numerous than in previous years.

Vineyards: The grape crop matured a full crop, which was of first quality. Of the black varieties, the Concord is the most successful, and of the reds, the Salem and Catawba. The Concord is the best market variety, and this with the Salem are the best for family uses. The average price per pound paid in this market this season, was from 5 to 8c. Location: On all locations, even on very sandy soils, and at the foot of the sand-hills, without any scientific treatment or any treatment at all, (in too many cases absolute neglect,) the results have been grand. The following is a list preferred of early medium and late varieties: Concord, Catawba, Goethe, Salem.

Small Fruits: On March 1st, 1886, plantations of all classes were in good condition, excepting the blackberry and raspberry, which were badly winter-killed. On November 1st, 1886, plantations of all classes were in very poor condition, caused by the effects of drouth. The best crops have been produced on light loams. The following is the average market price paid per crate of twenty-four boxes each during the season: Blackberry \$3.60, currant \$6, gooseberry \$2, raspberry \$3.60, strawberry \$4.80@5. The following is a list of the most successful varieties in this county: Blackberry, early, Kittatinny; late, Snyder; currant, Red Dutch, White

Dutch; gooseberry, Houghton; raspberry, early, Doolittle; medium, Miami; strawberry, early, Crescent, Wilson; medium, Sharpless, James Vick; late, Glendale.

Russian Fruits: The apple trees on March 1st, and November 1st, 1886, were in good condition. The following varieties fruited successfully in the present year: Red Astrachan, Tetofsky, Oldenburg. These are no more hardy in winter or summer than kinds common in the Western States. The apricot, on March 1st and November 1st, 1886, was in a good condition and made a fine wood growth. The age of the oldest planted trees in this county is fifteen years. They bloom every year, but never fruited, on account of the late frosts.

The acreage of fruit-planting is annually increasing in this county, and the general confidence of our people in horticultural work has not lessened during the present and preceding years. Farmers are planting fruits generally for home uses.

(South half.—By James Dunlop, Detroit.)

Orchards: On March 1st and November 1st, 1886, the condition of trees was good of all classes, and the wood growth was light. The per cent. of the spring planting that failed, of apple, peach and pear, probably 33 per cent., caused by the roots being injured by severe winter and by hot weather and drouth; the cherry not so bad as the above.

The best results have been produced by planting the apple, cherry and pear on an eastern slope, having a loamy soil, and protected by wind-breaks on the north-west and south sides; peach on high ground, protected on north and west.

The following varieties are the most successful in this county in fruit and tree: Apple—Summer, Cooper's Early [White], Carolina June, Early Harvest, Red Astrachan; autumn, Strawberry, Fall Wine, Smith's Cider, Wealthy; winter, Ben Davis, Missouri Pippin, Winesap, Jonathan, Grimes's Golden, Rawle's Genet. Cherry, Early Richmond, May Duke; peach, Alexander, Amsden; pear, Le Conte, Bartlett, Seckel, Angouleme; plum, Wild Goose, Miner.

Probably 75 per cent. of the apple crop this year was marketable. The following is the average price paid per bushel in this market this season: Apple \$1, cherry \$3, pear \$3.25, plum \$1.50 to \$2.

Considering the value of land, cost of trees, and necessary expense of planting and culture, the apple, cherry and plum are a profitable investment; the peach is not, and the pear not sufficiently tested.

The planting in the spring of 1886 was better than that of the year preceding, excepting of the peach.

Diseases: Sun-scald appeared on the apple, cherry twigs blasted by the hot winds in August, and peach trees suffered from curled-leaf.

Insects were not more prevalent than in previous years, excepting the flat-headed borer, which was more numerous.

Vineyards: Early grapes, and especially the Concord, matured a full crop. The following are the most successful varieties in this county: Black, Concord, Moore's [Early]; red, Draught Amber; white, Elvira. The Concord is the best market and family variety. The average price paid per pound in this market this season was 4c. The best results in the past five years have been produced from vineyards planted on a southeastern exposure, protected on the north and west, and on a loamy soil well enriched, and the vines supported on a smooth wire trellis. The preferred early, medium and late varieties are as follows: Moore's [Early], Draught Amber, Delaware, Concord, Elvira. No grape rot or mildew has been noticed.

Small Fruits: On March 1st, 1886, the condition of currant, gooseberry and strawberry was good, but canes of the blackberry and raspberry were badly injured. On November 1st, 1886, the condition of all plantations was good, excepting the

strawberry, which was bad. All classes excepting the currant seem to do best on a southwest exposure; currants should be shaded on the south. The following is the market price paid per crate of twenty-four boxes each during the season: Blackberry \$2.40, currant \$3.60, gooseberry \$1.45, raspberry and strawberry \$3. The following is a list of the most successful varieties in this county: Blackberry, early Snyder, Kittatinny; currant, Red Dutch, White Grape; gooseberry, Houghton, Downing; raspberry, medium and late, Cuthbert, Gregg, McCormick; strawberry, early, medium, and late, Wilson, Crescent, Ironclad, Cumberland.

Russian Fruits: On March 1st and November 1st, 1886, the apple was in good condition. The Red Astrachan and Oldenburg fruited successfully the present year. These trees are no more hardy than the kinds common in the Western States. The oldest planted apricot trees in this county are five or six years of age. Have not seen any in bloom or with fruit.

The acreage of fruit-planting in this county is annually increasing, and the general confidence of the people in horticultural work is getting stronger, and the farmers are planting fruits generally for home purposes.

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DONIPHAN COUNTY.—By S. HATCH, WATHENA.

Orchards: On March 1st and November 1st, 1886, the condition of trees was good, excepting the peach, which was badly winter-killed. The wood growth of 1886 was medium of all classes. Spring planting was as successful as usual, and has done well.

Location: The best results during the past years have been obtained from plantations on a slight elevation, having a clay loam slightly mixed with sand, and a porous subsoil on a limestone base

The following varieties are the most successful in this county in tree and fruit: Apple—Summer, Early Harvest, Carolina June, Red Astrachan; autumn, Fameuse, Fall Wine, Ortle, Jonathan, Maiden's Blush; winter, Winesap, Ben Davis, Missouri Pippin, Rawle's Genet, Huntsman's Favorite. Cherry, Early Richmond, common and English Morello; peach, Amsden, Alexander, Large Early York, Crawford's Early, Crawford's Late, Stump the World; pear, White Doyenne, Bartlett, Angouleme, Seckel, Buffum; plum, Wild Goose.

Of the apple crop of 1886, about 75 per cent. was marketable. The following is the average market price per bushel during the year: Apple 30c., cherry \$2, pear \$2.50, plum \$2.25.

Considering the value of land and cost of trees, and necessary expense in planting and culture, the apple is very profitable; the cherry is for family use, but is not for market—picking costs too much; the peach is for family use, but is too uncertain for market; the pear is for family use, but not for market; of the plum, none but the Wild Goose is profitable.

The spring planting of 1886 was not as successful as that of the preceding year.

Insects: The codlin moth and tree cricket have been damaging to the fruit of the apple, the flat-headed borer to the tree.

Vineyards: Of the grape crop, about 75 per cent. matured, and was much better in quality than in the preceding year. The following varieties, named in the order of their color, are the most successful: Black, Concord, Ives, Hartford [Prolific], Worden; red, Delaware. The Concord is the best market variety; the Concord and Delaware are the best family varieties. The average price per pound paid in this market this season was from 2c. to 2½c. Location and soil: The best results have been obtained from an elevation well exposed to the sun, and having a free circulation of air. In low, confined localities and soil too rich, the rot is more apt to be prevalent. The following early, medium and late varieties are preferred: Concord, Worden, Ives,

Delaware, Goethe. Grapes were comparatively free from rot this season, have not had any mildew of late years on the leaf; sulphur is a sure preventive for this disease.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were good, excepting the currant, which was only medium. Location and soil: For the blackberry, a northern slope with good rich soil is the best. The currant must be protected from the sun; raspberry should have a northern slope, and a clay loam soil; the strawberry must have a well-exposed location, and open to the sun. The average market price paid per crate of twenty-four boxes each during the season was: Blackberry, currant and raspberry \$2.50, strawberry \$2. The following are the most successful in this county: Blackberry, Snyder; currant, Red Dutch; raspberry, Doolittle, Souhegan; strawberry, Crescent.

The acreage of fruit-planting is annually increasing in this county. The general confidence of our people in the horticultural work has not lessened in the past or present years, and farmers are all planting fruits generally for home uses.

GRAHAM COUNTY.—By ROBERT BOYS, WHITFIELD.

Orchards: On March 1st and November 1st, 1886, trees of all classes were in good condition. The wood growth of 1886 was strong of all classes, and a very small per cent. of failures have occurred since 1884. Where proper attention was taken, not any of the spring planting failed. Considering the value of land and cost of trees, and necessary expense in planting and culture, orchards promise to be profitable.

The spring planting of 1886 was as heavy as that of the preceding year.

Small Fruits: On March 1st and November 1st, 1886, the condition of all plantations was good. The acreage of fruit-tree planting is increasing annually in this county, and the confidence of our people in horticultural interests has not lessened. Farmers are planting fruits generally for home uses.

ELLSWORTH COUNTY.—By F. J. SWEHLA, WILSON.

Orchards: On March 1st, 1886, the condition of all classes of trees was good, excepting the peach, which was very poor. On November 1st, 1886, trees of all classes were in good condition. The wood growth of 1886 was strong of the peach and pear, medium of apple and cherry, and plum light. Failures since 1884 were light of all classes excepting the peach, of which 90 per cent. are dead—could not survive the severe past winters.

Failures of the spring planting: Apple, pear and plum about 20 per cent., caused by drouth and injured trees.

Location and Soil: Apple, cherry and pear do best on an elevated northeasterly slope; peach and plum on a sheltered location, having a sandy, deep rich loam.

The following varieties are the most successful in this county in tree and fruit: Apple—Summer, Early Harvest, Carolina June, Early Ripe, Red Astrachan, Hightop Sweet; autumn, Maiden's Blush, Rambo, Grimes's Golden; winter, Ben Davis, Winesap, Rawle's Genet, Missouri Pippin. Cherry, Early Richmond; plum, Wild Goose, Lombard, Sand.

The extent of the spring planting of 1886 of the apple, cherry and pear was in excess of that of the preceding year, the peach and plum about the same.

Insects: The tree cricket damaged the apple crop, but not to the extent as in the year before. The plum curculio has been quite prevalent, but not as much as the year previous.

Vineyards: The Concord is the most successful variety in this county.

Small Fruits: On March 1st and November 1st, 1886, all plantations were in a

good healthy condition. The best results have been produced with the blackberry and strawberry on deep black loam, having a sandy subsoil well drained. The following is a list of the most successful varieties: Blackberry, Kittatinny, Snyder; gooseberry, Houghton, Downing; raspberry, early, Doolittle, Tyler, Souhegan; medium, McCormick; late, Gregg; Strawberry, early, Crescent, Chas. Downing, Wilson; medium, Capt. Jack; late, Sharpless, Kentucky.

Russian Fruits: On March 1st and November 1st, 1886, the apple trees were in fine condition, and the apricot was in a healthy condition.

The oldest planted trees in this county are nine years old; they have not bloomed. Farmers are planting fruits most generally for home uses.

JACKSON COUNTY.—By J. W. WILLIAMS, COPE.

Orchards: On March 1st, 1886, the condition of all classes of trees was good, excepting the peach, of which the old trees were injured; the young trees were in a fair condition. On November 1st, 1886, the cherry, peach and plum were in a good condition; the apple rather poor, on account of drouth; the pear was only fair, as considerable blight prevailed.

Failures since 1884: Of the apple and plum, 20 per cent., caused by insects, severe winters, and drouth; cherry 40 per cent., peach 75 per cent., caused by severe freezing; pear 75 per cent., caused by blight. Of the apple, 25 per cent., of the spring planting failed, caused by drouth.

The best results from the apple have been produced on a second-bottom cleared-up brush-land, sloping to the north. Other classes seem to produce, and do the best, on high land; and the pear, most particularly, on land with a stiff subsoil, is not so apt to blight.

The following varieties are the most successful in this county in tree and fruit: Apple—Summer, Early Harvest, Carolina June, American Summer; autumn, Maiden's Blush, Rambo, Jonathan; winter, Ben Davis, Missouri Pippin, Winesap, Willow Twig, Talman's Sweet, Rawle's Genet, Baldwin, Northern Spy. Cherry, Early Richmond; plum, Wild Goose, Damson; pear, Angouleme, Seckel.

Of the apple crop of 1886, only 25 per cent. was marketable, as the drouth injured the fruit as well as the tree. The following are the average market prices paid per bushel during the year: Apple 50c., cherry \$3.20, pear \$2, plum \$3.

Considering the value of land, cost of trees, and necessary expense of planting and cultivation, the culture of the apple, cherry and plum is very profitable; other classes are not.

The planting in the spring of 1886 was not in excess of that of the preceding year.

Diseases: Apple and pear trees have been damaged by twig blight to some extent.

Insects: Of the apple, borers and the codlin moth have damaged the tree and fruit; the pear has been infested by the fall web-worm; the fruit of the plum has been attacked by the curculio. All species were less numerous than in preceding years, excepting the fall web-worm, which seems to be on the increase.

Vineyards: Of the grape crop, seventy-five per cent. matured, and was of a superior quality. The following varieties have been most successful: Concord, Ives, Wilder, Clinton, Delaware, Dracut Amber, Pocklington, Martha. The Concord is the best market variety, the Pocklington and Clinton best family. The average price per pound paid in this market this season was three to four cents. Vineyards on high land, having a soil suitable for corn, thoroughly cultivated in summer, and trellised high on wires and given light summer pruning, have been most satisfactory. The following is a list of early, medium and late varieties preferred: Champion, Concord, Pocklington, Wilder, Martha, Delaware, Ives, Clinton.

Diseases: The rot has been prevalent during the past four or five years, but not severe the present season; mildew has appeared in a few places, but not to any alarming extent. I think close pruning in the winter, but little in the summer, and good cultivation, is the best remedy for rot; and instead of summer pruning, keep the vines well up on the trellis.

Small Fruits: On March 1st, 1886, the condition of plantations of all classes was good, excepting the raspberry, which was only fair. On November 1st, 1886, the currant, gooseberry and raspberry were in a good condition; the blackberry and strawberry rather poor, caused by drouth. **Locations and soil:** The blackberry has produced the best results on thin soil; other classes do best on any location having a good, rich soil. The following are the average market prices paid per crate of twenty-four boxes each during the season: Blackberry and raspberry \$3, currant \$2.40, gooseberry 75c., strawberry \$2.50. The following is the estimated yield per acre: Blackberry 830 quarts, currants 960 quarts, raspberry 7,500 quarts, strawberry 6,400 quarts. The following is a list of the most successful varieties in this county: Blackberry, early, Kittatinny; currant, Red Dutch, White Grape; gooseberry, Houghton; raspberry, early, Souhegan; medium, Doolittle, McCormick; late, Gregg; strawberry, early, Wilson's [Albany], Ironclad; medium, Capt. Jack, Chas. Downing; late, Crescent. [NOTE.—This must be a spurious variety, as the Crescent is very early.—Sno'r.]

The acreage of fruit-tree planting is annually increasing, and the confidence of the people in horticultural work seems to be on the increase. Farmers are planting fruits for general home purposes.

JEFFERSON COUNTY.—By JOSHUA WHEELER, NORTONVILLE.

(*Northern portion.*)

Orchards: On March 1st and November 1st, 1886, all classes of trees were in good condition, excepting the peach, which was poor. The wood growth of 1886 was light of the apple, cherry and pear; of the peach and plum, strong.

The per cent. of failures since 1884 was as follows: Of the apple about 20 per cent., caused by borers and drouth; cherry, 5 per cent., from old age; peach 60 per cent., caused by severe cold winter; pear, 50 per cent., by blight; plum 10 per cent., caused by working on peach stocks, and borers.

Failures in the spring planting: Apple about 25 per cent. caused by drouth; peach 50 per cent., caused by drouth; pear 75 per cent., caused by blight.

Location and Soil: A northern slope having a sandy loam, porous subsoil, near timber, is preferable for all orchards.

The following varieties are the most successful in this county in tree and fruit: Apple—Summer, Carolina June, Early Harvest, Early Pennock, Benoni; autumn, Maiden's Blush, Sops of Wine, Rambo; winter, Winesap, Ben Davis, Dominie, Rawley's Genet, Missouri Pippin, Willow Twig. Cherry, Early Richmond; peach, Amsden, Alexander, Coolidge's Favorite, Barnard, Stump the World, Crawford's Late; pear, Bartlett, Flemish Beauty, Seckel, Angouleme; plum, Wild Goose.

Of the apple crop of 1886, 60 per cent. was marketable. The average market price paid per bushel this year for apples was 30c., plums \$2.

Considering the value of land, cost of trees, and necessary expense in planting and culture, all classes of orchards are profitable excepting the pear.

The spring planting of 1886 did not exceed that of the previous year.

Insects: The borer has damaged the apple tree slightly. Curculio has attacked the fruit of the plum, but no more than in years previous.

Vineyards: About 60 per cent. of the grape crop matured this season in good quality. The Concord is the most successful black variety in this county, and the

Martha for a white variety, while the Concord is the best for both market and family variety. The average market price paid per pound this season was 4 cents. The following varieties are preferred: Concord, Martha, Hartford [Prolific]. One year ago the rot injured the crop 50 per cent., but this year not so heavily.

Small Fruits: On March 1st, 1886, the condition of plantations was good of all classes excepting the raspberry, which was winter-killed. On November 1st, 1886, plantations of all classes was good excepting the blackberry, which was injured by the drouth. Location and soil: All classes of small fruits do well on any good soil. The following are the average market prices paid per crate of twenty-four boxes each during the season: Blackberry \$2.25, raspberry and strawberry \$2. The average yield per acre of the blackberry was 1,500 quarts, strawberry 250 quarts. The following is a list of the most successful varieties in this county: Blackberry, Snyder; currant, Red Dutch, White Grape; raspberry, early, Turner; medium, McCormick, Reliance; strawberry, early, Crescent; medium, James Vick; late, Mt. Vernon, Jersey Queen.

Russian Fruits: The apricot was in a poor condition on March 1st and November 1st, 1886. The oldest trees in this county are six years old.

The general confidence of the people in horticultural work is increasing, and farmers are planting fruits for general home uses.

(Southern portion.—By H. R. Roberts, Perry.)

Orchards: On March 1st, 1886, the apple, cherry and peach were in a very poor condition, caused by the extreme cold winter of the preceding year; pear and plum were in a good condition. On November 1st, 1886, all classes were in a good condition, except the pear, which was badly blighted. The wood growth of 1886 was medium of all classes excepting the pear, which was light.

Of the failures since 1884, about 10 per cent. of the old apple trees, and probably 50 per cent. of the apple trees of the spring planting, failed.

Location and Soil: The best results have been produced on bottom or middle lands having a deep, rich, and well under-drained soil, this applies to all classes of trees.

The following are the most successful varieties in this county, in tree and fruit: Apple—Summer, Early Harvest, Red Astrachan, Carolina June, Lowell, Chenango; autumn, Maiden's Blush, Fall Wine, Autumn Strawberry, Jonathan, Wine; winter, Winesap, Ben Davis, Rawle's Genet, Missouri Pippin, Smith's Cider, Roman Stem, Yellow Bellflower, Rome Beauty. Cherry, Early Richmond.

Of the apple crop of 1886, about 65 per cent. was marketable. The average market prices paid during the year: Apple 40c., cherry \$2, plum \$1.

Considering the value of land, and cost of trees, and necessary expense in planting and culture, orchards are as profitable, if not more so, than any other crop.

Diseases and Insects: The blight has done considerable damage to the apple and pear trees; the codlin moth has been working on the apple to some extent, also the curculio on the plum. The fall web-worm is very numerous in the forests.

Vineyards: Of the grape crop of 1886, 50 per cent. matured, and was of fine quality. The Concord is the most successful variety in this county. The average price paid per pound in this market was 3c. Rot is prevalent here some years, and spoils nearly the entire crop, but was not so bad this year.

Small Fruits: On March 1, 1886, the currant, gooseberry and strawberry were in good condition, raspberry medium, blackberry poor. On November 1st, 1886, the condition of all classes was good.

The acreage of fruit-planting is annually increasing in this county.

(Central portion.—By E. Snyder, Oskaloosa.)

Orchards: On March 1st and November 1st, 1886, all classes of trees were in a good condition, excepting the peach, which was poor. The wood growth of 1886 was light of all classes. About 20 per cent. of the spring-planted apples failed, caused by drouth.

Location and Soil: A northwestern slope and a clay loam have produced the best result with all classes.

The following are the most successful varieties in this county in tree and fruit: Apple—Summer, Early Harvest, Red Astrachan, American Pearmain; autumn, Jonathan, Maiden's Blush; winter, Winesap, Missouri Pippin, Minkler, Ben Davis, Rawle's Genet. Cherry, Early Richmond, English Morello; plum, Wild Goose.

Of the apple crop of 1886, 75 per cent. was marketable. The following market price was paid per bushel during the present season: Apple 30c., cherry and plum \$2.

Considering the value of land and cost of trees, and necessary expense in planting and culture, orchards of varieties adapted to the climate and soil are profitable.

The spring planting of 1886 was not as good as that of the preceding season.

The only insects prevalent are the apple-tree borer and plum curculio, which are diminishing in numbers.

Vineyards: The entire grape crop matured this season, and was of a good quality. The Concord is the most successful and the best market and family variety in this county.

JEWELL COUNTY.—By E. T. BYRAM, JEWELL.

Orchards: On March 1st and November 1st, 1886, the condition of all classes of trees was good.

The per cent. of failures since 1884 is as follows: Apple 5 to 10 per cent., caused by carelessness; peach about 50 per cent., caused by severe winters and borers. Per cent. of failures of the spring planting: Apple 20 per cent., caused by being in bad condition when received from nursery; cherry, from my own experience, 50 per cent., caused by bad trees when planted.

As to location and soil, there is very little choice, in my estimation, but rich upland is preferred.

The following varieties are the most successful in this county in tree and fruit: Apple—Summer, Early Harvest, Oldenburg, Cooper's Early, Red Astrachan, Lowell; autumn, Maiden's Blush, Wine (syn. Pennsylvania Redstreak), Jonathan; winter, Missouri Pippin, Winesap, Jonathan, White Winter Pearmain, Ben Davis. Cherry, Early Richmond, English Morello.

Of the apple crop of 1886, from 75 to 80 per cent. was marketable fruit. The average market price paid per bushel during the year was as follows: Apple \$1, cherry \$3, plum \$2.

Considering the value of the land, and cost of trees and necessary expense of planting and culture, I am pretty sure orchards of all classes are profitable, excepting of the peach.

Insects: The apple has been troubled by the codlin moth and tree cricket, but not so much as in years previous; cherry and plum have been attacked by the curculio, but no more than in years heretofore.

Vineyards: The grape matured from 75 to 80 per cent. of a crop, and in quality was as good as in years previous. The Concord is the most successful, and the best market and family variety in this county. The average price paid per pound in this market, 5c. The best results, during the past five years, have been produced from gently rolling upland or second-bottom soils.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes

were in a good condition. Location and soil: The best results of the blackberry have been produced on a rich loamy soil; the currant, on rich soil, and when planted on the north side of a high board fence. The following is a list of the most successful varieties in this county; Blackberry, early, Wilson's Early; medium, Kittatinny; late, Snyder; currant, Red Dutch; gooseberry, Mountain [Seedling]; raspberry, early, natives; medium, McCormick; late, Gregg; strawberry, early, Crescent, Sharpless; medium, Wilson, Capt. Jack, Sharpless; late, Glendale, Manchester.

Russian Fruits: On March 1st and November 1st, 1886, the apple was in good condition. The following varieties fruited successfully the present year: Tetofsky, Gen. Grant, Weatherby (?), Iowa Blush (?). The apricot is not worthy of cultivation.

The acreage of fruit-planting is yearly increasing, and the confidence of our people in horticultural work is not lessening. Farmers are planting fruits for general home uses.

LEAVENWORTH COUNTY.—By E. J. HOLMAN, LEAVENWORTH.

(*Eastern portion.*)

Orchards: On March 1st, 1886, all classes were more or less injured by the last two extremely cold winters, excepting the plum, which was in a good condition. On November 1st, 1886, the condition of the apple and plum was good; cherry and peach, poor; pear, fair. The wood growth of 1886 was medium of all classes, excepting the cherry, which was light.

The per cent. of failures since 1884: Of the apple, 10 per cent., cherry, 50, caused by severe cold, drouth, and neglect; peach, 90, caused mainly by sun-scald; pear, 30 per cent., caused by blight; plum, 15 per cent., caused by old age and worn out.

Failures in the spring planting: Apple, 75 per cent.; cherry and peach, 80 per cent.; pear, 40 per cent.; plum, 25 per cent., caused by the drouth.

Location and Soil: The apple is most successful on a sandy soil and loose subsoil; cherry, heavy loam; peach, light loam mixed with sand on any location outside of the bottoms; pear, heavy clay, porous subsoil, any elevation; plum, any soil and location.

The following varieties are the most successful in this county in fruit and tree: Apple—Summer, early, Harvest, Summer Queen, Oldenburg, Early Pennock; autumn, Maiden's Blush, Orange Pippin, Autumn Swaar, Porter; winter, Ben Davis, Jonathan, Winesap, Rawle's Genet, Willow Twig, Minkler, Baldwin, Fameuse, Dominie. Cherry, English Morello, Early Richmond; peach, Amsden, Large Early York, George IV; pear, early, Margaret, Bloodgood, Bartlett; peach, Stump the World, Ward's Late, Old Mixon, Smock; pear, Angouleme, Seckel, Howell, [Beurre] Clairgeau, [Beurre De] Anjou, Winter Nelis, Vicar; plum, Shropshire Damson, and common.

Of the apple crop of 1886, about 75 per cent. was marketable. The following is the average market price paid per bushel during the season: Apple 33½c., cherry \$2.25, pear \$3, plum \$2.25.

Considering the value of land and cost of trees, and necessary expense of planting and culture, orchards of all classes are profitable. Blight has injured the apple and pear to some extent.

Insects: The tent caterpillar is damaging the apple tree more than common; other insects are not so numerous as in years heretofore. The curculio is somewhat prevalent, but is decreasing in numbers. The fall web-worm is more numerous than in preceding years.

Vineyards: The grape matured 60 per cent. of a crop, which graded 90 per cent. in quality. The following are the most successful varieties: Black, Concord, Early

Victor, Ives; white, Martha, Lady, Pocklington, Niagara. The Concord is the best market and the Early Victor the best family variety. The average market price paid per pound in this market this year was 4c. Locations and soils: I have not noticed any material difference in the results of varying locations and soils. The practice of cutting back the vines for the purpose of renewing their wood, has furnished pleasing results even in old vineyards. The following is a list of varieties preferred: Early Victor, Martha, Worden, Delaware, Concord. Diseases: The rot has been prevalent in this county during the past and present years, injuring the crop 50 per cent., and mildew has attacked the leaf; have no remedy by which to prevent its occurring.

Small Fruits: On March 1st, 1886, plantations of all classes were in a good condition. On November 1st, 1886, the currant and gooseberry were in a good condition, but other classes were badly injured. Location and soil: The following locations and soils have produced the best results: For the blackberry, a hillside and northern exposure; currant, continuous shade, with a well drained, moist loam; gooseberry and raspberry, all drained soils, shaded location; strawberry, any well-drained and cultivated soil and location. The following is the average market price paid per crate of twenty-four boxes each: Blackberry \$4, currant \$3, gooseberry \$1.50, raspberry \$3.25, strawberry \$1.75. The estimated yield of crates per acre is as follows: Blackberry 24; currant and strawberry 100, gooseberry 50, raspberry 30. The following is a list of the most successful varieties in this county: Blackberry, early, Early Harvest; medium, Snyder; late, Snyder; currant, Red Dutch, Fay's Prolific, White Grape, White Dutch; gooseberry, Houghton, Downing, Pale Red; raspberry, early, Souhegan, Doolittle, Hopkins, Turner; medium, McCormick, Ohio, Brandywine, Thwack; late, Gregg, Cuthbert; strawberry, early, Crescent, Downer's [Prolific]; medium, Capt. Jack, Chas. Downing; late, Glendale, Sharpless, Mt. Vernon, Champion.

Russian Fruits: The following varieties of apple fruited successfully the present season: Summer, Oldenburg. Red Astrachan; winter, Fameuse. Apricot: On March 1st and November 1st, 1886, all classes were in a good condition. The oldest planted trees in this county are four or five years; they are too young to bear.

The acreage of fruit-planting in this county is slowly increasing, and the general confidence of our people in the work of horticulture is not lessening. Farmers are planting fruits, as a general thing, for home uses.

(Western portion.—By J. C. Baird, Easton.)

Orchards: On March 1st, 1886, trees of all classes were in a good condition, excepting the plum, which was mostly damaged. On November 1st, 1886, all classes of trees were in good condition. The wood growth in 1886 of the apple and pear was light; others medium.

Per cent. of failures since 1884: Of the apple, 10 per cent., caused by cold winters, wind storms, and excessive dry, hot summers; pear about 20 per cent., caused by blight, heat and cold. The per cent. of failures occurring in the spring planting is as follows: Apple 90 to 100 per cent.; cherry and pear 10 per cent., caused by long, continuous drouth.

Location and Soil: The following locations and soils have proven the best for tree and fruit in the past year: Apple, rolling land well drained, on a northern slope, clay-loam soil with clay subsoil; cherry, any soil, excepting light gravelly; peach and pear, high, dry, light soil, with a clay subsoil.

The following varieties are the most successful in this county in tree and fruit: Apple—Summer, Early Harvest, Red Astrachan, Early Pennock; autumn, Cooper's Early [White], Fulton, Dominie, Jonathan, Maiden's Blush, Gravenstein, St. Lawrence; winter, Winesap, Ben Davis, Willow Twig, Rome Beauty, Smith's Cider,

Rawle's Genet. Cherry, Early Richmond; pear, Bartlett, Angouleme, Washington, Seckel, White Doyenne; plum, Blue Damson.

Of the apple crop of 1886, about 37½ per cent. was marketable. The following is the average market price paid per bushel during the season: Apple 25c., cherry \$2, pear \$2 to \$3.

Considering the value of land, cost of trees, and necessary expense of planting and culture, orchards are very profitable for family purposes, but hardly for market.

The codlin moth and some caterpillar have been damaging the apple to some extent. The canker worm is on the increase in numbers.

Vineyards: The Concord is the most successful, best market and best family variety in the county. The average market price paid per pound this season was 3c. Location: A vineyard does best on a high, dry, well-drained, light or sandy or gravelly soil, trained on wire trellises. The Concord is the preferred variety here. Last year the grape crop was almost entirely ruined by the rot.

Small Fruits: On March 1st, 1886, the currant and gooseberry were in a good condition; blackberry and raspberry were more or less injured by the winter. On November 1st, 1886, plantations of all classes were in good condition. The average market price paid per crate of twenty-four boxes each were as follows: Blackberry, \$2.50, cherry \$2, gooseberry \$2.25, raspberry \$1.50 to \$2.50, strawberry \$2.50. The most successful varieties in this county are as follows: Blackberry, early, Kit-tatinny and Lawton; currant, Red Dutch, White Grape; gooseberry, Houghton; raspberry, early, Doolittle; medium, McCormick; late, Gregg.

The acreage of fruit-planting is annually decreasing in this county, but the general confidence of our people in horticultural work is not lessening. Farmers are planting fruits for home uses.

LINCOLN COUNTY.—BY JACOB WEIDMAN, PLEASANT VALLEY.

Orchards: On March 1st, 1886, all classes of trees were in a good condition, excepting the peach. On November 1st, 1886, the condition of all classes of trees was good. The wood growth of 1886 of bearing trees was medium; of young trees, strong.

Since 1884, 50 per cent. of the peach trees failed, and of the spring planting the apple failed 25 per cent., pear 10 per cent., which was caused by neglect during a dry spell in June.

The best results of the apple have been produced on second-bottom land; the pear best on sandstone soil.

The following varieties have been the most successful in this county in tree and fruit: Apple—Summer, Early Harvest, Red Astrachan, Oldenburg, Tetofsky; autumn, Maiden's Blush, Jonathan, Grimes's Golden, Fall Wine; winter, Rawle's Genet, Winesap, Ben Davis, Willow Twig, Lawver, Gilpin, Lady. Pear, Clapp's Favorite, Bartlett, Seckel, Flemish Beauty, Sheldon, Angouleme; plum, Wild Goose, Blue Damson; cherry, Early Richmond, English Morello.

The entire apple crop of 1886 was marketable. The following is the average market price paid per bushel during the year: Apple \$1, cherry \$4, plum \$1.50.

Considering the value of land, cost of trees, and necessary expense of planting and culture, all classes of orchards are very profitable. There were more trees planted last spring than any year before.

Insects: The flat-headed apple-tree borer made its appearance this year, and the curculio is more numerous than in preceding years.

Vineyards: The grape crop was a full one, and of good quality. The following are the most successful varieties: Black, Champion, Ives, Concord, Early Victor, Hartford, Herman, Neosho; red, Amber, Dracut Amber, Brighton, Perkins, Catawba,

Goethe; white, Elvira, Martha Seedling, Pocklington, Missouri Reisling, Noah, Grein's Golden. For a market grape, the Concord is the best; the Elvira for family use. The average market price paid per pound was 8c. Location and soil: The most satisfactory results have been produced on an eastern slope, sandy loam, and on low trellises.

Small Fruits: On March 1st, 1886, all plantations were in a good condition, excepting the blackberry, which was badly broken down by the snow, and winter-killed. On November 1st, 1886, plantations of all classes were in a good condition. Second bottom and good, rich, loose soil is the best location and soil for the blackberry. The following are the average market prices paid per crate of twenty-four boxes each during the season: Blackberry and raspberry \$3.60, strawberry \$4.80. The following is a list of the most successful varieties in this county: Blackberry, early, Kittatiny; medium, Lawton; late, Snyder, Taylor; gooseberry, Houghton, Mountain; raspberry, early, Doolittle, Souhegan; medium, Hopkins, Shaffer's [Colossal] Tyler; late, Turner; strawberry, early, Charles Downing, Crescent, Bidwell; medium, Wilson, Captain Jack; late, James Vick.

Russian Fruits: On March 1st and November 1st, 1886, the apple was in a good condition. The following varieties fruited successfully the present year: Summer, Tetofsky, Oldenburg; autumn, Wealthy. There is no difference in the hardiness between these sorts and those common in the Western States. The apricot, on March 1st, 1886, was badly winter-killed, and had not recovered on November 1st, 1886. The age of the oldest trees planted in this county is about four years.

The acreage of fruit-planting is very rapidly increasing in the county. The general confidence of our people in the work of horticulture has not lessened during the past and present years, and farmers are generally planting fruits for home uses.

MARSHALL COUNTY.—BY JOHN MCKEE, REEDSVILLE.

Orchards: On March 1st, 1886, trees of all classes were in a good condition, excepting the peach and pear, which were very poor; but on November 1st, following, trees of all classes were in a good condition. The wood growth of 1886 was light of all classes, caused by the drouth.

A northern slope and rich soil have produced the best results in orchards planted in the county.

The average price paid for apples per bushel in this market was 65c.

Considering the value of land, cost of trees and necessary expense of planting and culture, orchards are profitable, if we can find a market for their product.

Vineyards: The Concord is the best market variety growing in this county. Its crop has been abundant, and sold readily in the market at 3c. per pound. The best results have been produced on well-drained rich soil.

The acreage of fruit-planting is annually increasing, and the general confidence of our people in horticultural work is getting stronger. Farmers are generally planting fruit trees for their home uses.

(By D. Harbaugh, Waterville.)

Orchards: On March 1st, 1886, trees of all classes were in a good condition. On November 1st, 1886, the apple and pear were badly damaged by the blight. The wood growth of 1886 was medium of all classes.

Since the season of 1884, five per cent. of apple trees has failed; of the pear, 75 per cent., caused by blight; about 50 per cent. of the spring planting of the apple failed, caused by drouth.

A northern slope with a clay loam has produced the best results in the past year.

The most successful varieties in this county in tree and fruit are as follows: Apple—Summer, Cooper's Early [White], Early Harvest, Early Pennock, Hightop Sweet; autumn, Maiden's Blush, Fameuse, Rambo; winter, Missouri Pippin, Ben Davis, Willow Twig, Jonathan, Dominie, Winesap, White Winter Pearmain, Milam, Wagener.

About 90 per cent. of the apple crop was marketable this season.

Considering the value of land, cost of trees, and necessary expense of planting and culture, orchards of all classes are profitable for family and market purposes.

The age of the oldest planted trees in this county is about 20 years. The acreage of fruit-planting is annually increasing in this county, and the confidence of our people in horticultural work has not lessened. Farmers are generally planting fruit trees for home purposes.

MITCHELL COUNTY.—By E. A. TAYLOR, BELOIT.

Orchards: On March 1st, 1886, the condition of all classes of trees was good, excepting the peach, which was badly winter-killed. On November 1st, 1886, the condition of all classes of trees was good.

The failures since the year 1884 of apple and pear were about 10 per cent., caused from neglect; peach 50 per cent., caused by severe winters; plum 5 per cent., caused by neglect.

Per cent. of failures in the spring plant: Apple and plum 5 per cent., cherry 20 per cent., peach 15 per cent., caused by neglect.

Location and character of soil: All classes produce the best results on a high rolling location, northeasterly exposure, and clay subsoil.

The following is a list of varieties most successful in this county in fruit and tree: Apple—Summer, Hightop Sweet, Carolina June, Cooper's Early, Red Astrachan; autumn, Wine (syn. Pennsylvania Redstreak), Chenango, Rambo, Jonathan, Grimes's Golden; winter, Winesap, Ben Davis, Missouri Pippin, Rawle's Genet, Limber Twig, Gilpin, Dominie. Cherry, Early Richmond, English Morello, Montmorency; peach, Alexander, Amsden, Crawford's Early, Louise, Large Early York, Stump the World, George IV; pear, Summer Doyenne, Osband's Summer, Bartlett, Seckel, Angouleme, Flemish Beauty, Winter Nelis, Vicar; plum, Wild Goose.

In 1886 about 75 per cent. of the apple crop was marketable. The following is the average market price paid per bushel during the season: Apple \$1, cherry and pear \$4, plum \$2.50.

Considering the value of land, cost of trees, and necessary expense of planting and culture, the apple, cherry and pear orchards are very profitable; but it is rather doubtful about the peach and plum.

The extent of the planting of the apple, cherry and pear in 1886 was in excess of that of the previous year, of others not.

Insects: The codlin moth has been damaging to the apple. The plum was attacked by the curculio. Both of these insects are decreasing in number.

Vineyards: A full crop matured, and was of good quality. Of the black varieties the Concord is the most successful, and of the red varieties Dracut Amber. The Concord is the best for market and family uses. The average price paid per pound in this market this season was 4½c. Location and soil: Any location excepting a south or southwestern exposure, and any good soil, will produce satisfactory results. The following varieties are preferred: Ives, Concord, Dracut Amber.

Small Fruits: On March 1st, 1886, all plantations were in a good condition excepting the blackberry and raspberry, which were injured by the winter; but on November following, all plantations were in a good condition. The blackberry does the best on a northern slope and a rich loose soil. The following is the average mar-

ket price paid per crate of twenty-four boxes each for the fruit: Blackberry \$3, currant, raspberry and strawberry \$3.50, gooseberry \$2.50. The following is a list of the most successful varieties in this county: Blackberry, Snyder; currant, Red Dutch, White Grape; gooseberry, Smith, Downing, Houghton; raspberry, early, Turner; late, Gregg; strawberry, medium, Wilson, Crescent.

Russian Fruits: Apple—On March 1st and November 1st, 1886, the trees were in good condition. The Red Astrachan fruited successfully the present season. The apricot, on March 1st, was somewhat injured by the winter.

The oldest-planted trees in this county are five years. The acreage of fruit-planting is annually increasing in this county, and the general confidence of our people in horticultural work is growing stronger. Farmers are planting fruit trees for general home uses.

NEMAHA COUNTY.—By GEO. A. WETMORE, ONEIDA, AND JOHN FULLER, SENECA.

(*North half.*)

Orchards: On March 1st and November 1st, 1886, all classes of trees were in a good condition. The wood growth of 1886 was medium of the apple; of the others, strong. Of the spring planting, 5 per cent. of the apple failed, caused by drouth.

In 1886, 50 per cent. of the apple crop was marketable. The average market price of the apple per bushel was 50c., cherry \$2.

Considering the value of land and cost of trees, and necessary expense in planting and culture, orchards are a profitable investment for family and market purposes.

The spring planting of 1886 was in excess of that of the year before.

Insects: The fall web-worm is increasing in number in this county.

Vineyards: The Concord is the only variety grown to any extent in this county. It matured about half a crop this year.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in a good condition. The following are the average market prices paid per crate of twenty-four boxes each for the product: Gooseberry \$1, raspberry and strawberry \$2.40.

Russian Fruits: A few varieties of the apple were set during the past spring. On March 1st and November 1st, 1886, the apricot trees were all dead.

The oldest-planted trees in this county are now about 20 years old. The acreage of fruit-tree planting is annually increasing in this county, and the general confidence of our people in the work of horticulture has not lessened. Farmers are generally planting fruits for their home uses.

(*South half.—By E. L. Rosenberger, Sabetha.*)

Orchards: On March 1st, 1886, all trees were in a good condition excepting the peach, which was badly winter-killed; but on November 1st, 1886, all classes of trees were in a good condition. The wood growth of 1886 was medium of the apple, cherry and pear; peach and plum strong.

Since the season of 1884, 30 per cent. of the peach trees have failed. The per cent. of the spring planting that failed is as follows: Apple, about 5 per cent.; cherry, 6 per cent.; peach and plum, 4 per cent., caused by a dry spring.

Location and Soil: The apple succeeds on any well-drained northern slope, cherry and peach on a deeply-cultivated clay loam.

In 1886, 90 per cent. of the apple crop was marketable. The average market price paid for apples per bushel this season ranged from 25 to 75c., cherry from \$1.90 to \$3.20.

Considering the value of land, cost of trees, and necessary expense of planting and culture, apple, cherry and plum orchards are profitable, others are not.

The spring planting of 1886 was in excess of that of the preceding years. Blight has damaged the apple and pear.

Vineyards: The vines matured 75 per cent. of a full crop. The Niagara is the most successful white variety in this county. Concord is the best market and family grape we have. The average price paid per pound was 2½c. Location: Vineyards have produced the best results for the past five years on a well-enriched soil, having been cultivated the first few years after planting, and then mulched. During the season of 1885 the rot was very destructive, but it was not the present year.

Small Fruits: On March 1st, 1886, plantations of all classes were in good condition. On November 1st, 1886, all plantations were in a good condition, excepting the strawberry, which was poor. The following locations and soils have produced the best results: For the blackberry, a good, deep soil, with clay subsoil; currant, enriched garden soil; gooseberry, any well-prepared soil; raspberry, good cultivated soil; strawberry, enriched soil kept clear of weeds. The following is the average market price paid for the fruit per crate of twenty-four boxes during the season: Blackberry \$5 to \$3.60, raspberry \$3.60, strawberry \$2.40 to \$4.80. The following is a list of the most successful varieties in this county: Blackberry, Snyder; strawberry, Crescent.

The acreage of fruit-planting seems to be annually increasing, and the confidence of our people is not lessening in the work of horticulture. Farmers are planting fruits for general home uses.

OSBORNE COUNTY.—By W. G. SHORT, POTTERVILLE.

Orchards: On March 1st, 1886, all classes of trees were in a good condition, excepting the peach, which was badly winter-killed. On November 1st, 1886, the apple and pear were in only a medium condition, others were good.

Failures since 1884: The peach suffered 50 per cent. from the effects of borers and severe winters.

Per cent. of failures of the spring planting: Apple, where they were mulched, 10 per cent.; where they were cultivated, 20 per cent., caused by the drouth in the latter part of the summer; cherry 5 per cent.; plum 30 per cent., caused by planting weak, sickly trees, and the drouth.

Location and Soil: The apple has produced the best results on a rich soil with good wind-breaks for a protection. There is no material difference as to the character of location; cherry has given satisfaction on a rich soil, as a vigorous growth in the tree is important to its success.

Considering the value of land, cost of trees, and necessary expense of planting and culture, the apple and cherry are profitable; others have not been thoroughly tested.

The planting in the spring of 1886 was in excess of that of the preceding year.

Insects: The codlin moth is prevalent, but no more than in years before. In fact, insects are not so numerous as they have been.

Vineyards: The grape matured a full crop this season, which was superior in quality. The Concord is the only variety grown here to any extent.

Small Fruits: On March 1st, 1886, plantations of all classes were in a good condition, excepting the blackberry, which was badly winter-killed; but on November 1st, 1886, plantations of all classes were in a good condition.

The acreage of fruit-planting in this county is annually increasing, and the confidence of our people in horticultural work is largely increasing also. Farmers are planting fruits for their home uses.

OTTAWA COUNTY.—By C. H. SHEFFIELD, DELPHOS.

(*North portion.*)

Orchards: Of the apple, about 20 per cent. of the spring planting failed; cherry, 10 per cent., and about the same of pear and plum, caused by drouth.

Location and Soil: The best results have been obtained from a rich, alluvial soil, on table or second-bottom lands.

The following is a list of the most successful varieties in this county in tree and fruit: Apples—Summer, Red Astrachan, Early Harvest, Carolina June; autumn, Maiden's Blush, Benoni, Cooper's Early, Lowell; winter, Ben Davis, Winesap, Missouri Pippin, Rawle's Genet, Grimes's Golden, Wagener. Cherry, Early Richmond; pear, Clapp's Favorite, Osband's Summer, Bartlett, Angouleme, Flemish Beauty, Seckel, Vicar, Winter Nelis.

Of the apple crop of 1886, about 50 per cent. was marketable. The following is the average market price paid per bushel during the season: Apple \$1.25, cherry \$3.20, pear \$4, plum \$2.

Taking everything into consideration—as value of land, cost of trees, necessary expense of planting and cultivation—orchards are very profitable for market or family use.

The spring planting of 1886 was in excess of that of the preceding years.

Insects: The codlin moth is damaging the apple more the present season than in preceding years, also the tree cricket and fall web-worm.

Vineyards: The grape matured 90 per cent. of a full crop the present year. Of the black varieties, the Concord and Moore's Early are the most successful; of the white varieties, the Niagara. The Concord is the best variety for all purposes. Vines do the best on a high southern slope. The Moore's Early and Concord are preferred varieties.

Small Fruits: On March 1st, 1886, the blackberry and raspberry were slightly injured; others were in a good condition. On November 1st, 1886, all plantations were in a good condition, excepting the strawberry, which was only medium.

Soils and Location: The blackberry and raspberry produce the best results on rich bottom lands; currant on upland prairie, well mulched, and shaded. The following is the average market price paid per crate of twenty-four boxes each during the season for the fruit: Blackberry and raspberry \$2.40, gooseberry \$1.50, strawberry \$2.50. The following is a list of the most successful varieties in this county: Blackberry, medium, Snyder; currant, Red Dutch, White Grape; gooseberry, Houghton; raspberry, medium, McCormick; late, Gregg; strawberry, early, Crescent.

The acreage of fruit-planting in this county is annually increasing, and the general confidence of our people in the work of horticulture is stronger. Farmers are planting fruits for general home uses.

(*Central portion.—By William Goddard, Minneapolis.*)

Orchards: On March 1st, and November 1st, 1886, trees of all classes were in a good condition excepting the peach, which was poor. The wood growth of 1886 was strong of all classes. Cherry, peach, pear, and plum, where not mulched, failed lightly.

In this portion of the county I cannot see much difference in results of different locations. The quickest and best results have been obtained on sandy loam with a porous subsoil.

The following varieties are the most successful in this county in tree and fruit: Apple—Summer, Carolina June, Cooper's Early, Maiden's Blush; autumn, Lowell, Jonathan, Chenango, Rome Beauty, Wine; winter, Missouri Pippin, Winesap, Gil-

pin, Rawle's Genet, Willow Twig. Cherry, Early Richmond; plum, Wild Goose, Miner, Weaver.

In 1886, 75 per cent. of the apple crop was marketable. The average market prices paid per bushel in this market were as follows: Apple \$1@ \$1.75, cherry \$3.80, plum \$2.

Considering the value of land, cost of trees, and necessary expense of planting and culture, orchards of all classes, excepting the peach, are the most profitable part of a farm.

The planting of the spring of 1886 was in excess of that of the preceding years.

Insects: The codlin moth has been damaging to the apple no more than in former years. The curculio and peach-tree borers are on the increase.

Vineyards: Vineyards bore a full crop in 1886, which was of excellent quality. The Concord is the most successful black grape, and the Dracut Amber is the most successful red. The first is the best for market and family uses. The average market price paid per pound this season was 6c. The only varieties we have are the Concord and Dracut Amber.

Small Fruits: On March 1st, 1886, the blackberry was in a poor condition; others were in a good condition. On November 1st, 1886, plantations of all classes were in a good condition. The most successful varieties in this county: Blackberry, early, Kittatinny; late, Snyder; gooseberry, Houghton; raspberry, early, Turner; strawberry, early, Col. Cheney, Wilson; medium, James Vick; late, Glendale.

The acreage of fruit-planting is largely increasing in this county, and the general confidence of our people in horticultural work is rapidly increasing. Farmers are planting fruits for general home uses.

(Southern portion.—By J. C. Hobson, Windsor.)

Orchards: On March 1st, 1886, trees of all classes were in a good condition, excepting the peach, which was poor. On November 1st, 1886, trees of all classes were in a good condition. The wood growth of all classes of trees in 1886 was medium, excepting the peach, which was light.

Of the spring planting, about 10 per cent. of the apple, cherry, and peach, and 5 per cent. of the pear failed for lack of rain.

Location and Soil: The apple produces best on well-drained bottom land; cherry on elevated land with a north or northeastern slope; peach, highland sloping to the northeast; pear, highland sloping to the north, on a loamy soil with a clay subsoil; plum, highland with an eastern exposure.

The following varieties are the most successful in this county in tree and fruit: Apple—Summer, Carolina June, Early Harvest, Red Astrachan; autumn, Maiden's Blush, Dominie, Jonathan; winter, Ben Davis, Missouri Pippin, Winesap, Rawle's Genet, Willow Twig. Cherry, Early May; pear, Angouleme, Bartlett, Flemish Beauty.

The crop of apples for 1886 yielded a marketable product of 75 per cent. Average prices paid per bushel in the market: Apple 90c., plum \$4.

Considering the value of land, cost of trees, and necessary expense of planting and culture, all orchards excepting the peach are profitable.

Insects: The borers and leaf-roller are prevalent with the apple, but not as much so as in preceding years. The round-headed apple-tree borer is a little worse than before.

Vineyards: The present season about one-half of the crop matured, but it was not as good in quality as usual. The following varieties are the most successful: Black, Concord, Moore's [Early], Worden, Brighton; white, Elvira. For market purposes the Concord is the best; for family purposes, the Brighton. The average market

price paid per pound this season was 6c. Location: Vineyards have produced the best results during the past five years on highland sloping to the southwest, trained to stakes in rows four feet apart. The following varieties are preferred: Moore's Early, Elvira, Worden, Concord, Pocklington, Brighton.

Small Fruits: On March 1st, 1886, plantations of all classes were in good condition, excepting the blackberry, which was injured by the winter. On November 1st, 1886, plantations of all classes were in good conditions, excepting the currant, which was rather poor. Small fruits of all classes do the best on an elevated land with loamy soil. The most successful varieties in this county are: Blackberry, medium, Kittatinny; late, Snyder; currant, Red Dutch; gooseberry, Houghton; raspberry, medium, McCormick; late, Gregg, Outhbert; strawberry, early, Crescent; medium, Monarch; late, Finch.

The acreage of fruit-planting in this county is annually increasing, and the general confidence of our people in horticultural work is not lessening. The farmers are generally planting fruits for home uses.

PHILLIPS COUNTY—By J. W. KNODLE, DICKEYVILLE.

Oorchards: On March 1st, 1886, trees of all classes were in a good condition, excepting the peach, which was badly injured. On November 1st, 1886, trees of all classes were in good condition. The wood growth of 1886 was light of all classes. Of the spring planting, about 60 per cent. of the apple failed.

Location: The apple does best on a high, level, rich soil; cherry, high elevation, soil not too rich; peach, soil not too rich, but a sheltered location.

The varieties most successful in this county in tree and fruit are as follows: Apple—Autumn, Maiden's Blush; winter, Ben Davis, Rawle's Genet, Whitney's No. 20 (crab), Missouri Pippin, Winesap. Cherry, Early Richmond, English Morello; pear, LeConte, Kieffer, Bartlett; plum, Wild Goose, Miner.

The following market prices were paid per bushel during the year: Apple \$1.50, cherry and peach \$2, plum \$3.

Considering the value of land, cost of trees, and necessary expense of planting and cultivating, apple, cherry and plum orchards are profitable; peach and pear are not.

Insects: The tent caterpillar has defoliated the plum for the past three years.

Vineyards: The following varieties are the most successful in this county: black, Concord, Clinton, Moore's [Early], Worden; red, Iona, Dracut Amber; white, Lady. The Concord is the best variety for market. The average market price paid per pound this season was 5c. Location: Vineyards have done the best the past five years on a high, level land, on soil that will yield a good corn crop, with sufficient wind-breaks for a protection, and clean cultivation. I prefer the Victor for early, Moore's [Early] for medium, and Concord for late.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in good condition. All classes of small fruits produce the best results on rich land. The following is a list of the most successful varieties in this county: Blackberry, late, Snyder; currant, Red Dutch, White Dutch; gooseberry, Houghton, Downing; raspberry, medium, McCormick, Canada; strawberry, medium, Ironclad, Wilson.

Russian Fruits: Apple—On March 1st and November 1st, 1886, the trees were in good condition.

The acreage of fruit-planting is annually increasing in the county. The general confidence of our people in the work of horticulture has not lessened during the past and present years, and farmers are planting fruit as fast as they can afford to, for home uses.

POTTAWATOMIE COUNTY.—By JOSEPH LEACH, HAVENSVILLE.

Orchards: On March 1st and November 1st, 1886, trees of all classes were in a good condition.

Since 1884, the apple and pear failed on an average $3\frac{1}{2}$ per cent., caused by blight. Of the spring planting, 50 per cent. of the apple failed, caused by the season's drouth.

The most successful varieties in this county in tree and fruit are as follows: Apple—Summer, Early Harvest, Carolina June, Red Astrachan; autumn, Maiden's Blush, Rambo, Fallawater; winter, Ben Davis, Missouri Pippin, Winesap, Rawle's Genet, Dominie. Cherry, Early Richmond, May Duke; plum, Wild Goose, Miner.

Of the apple crop of 1886, 20 per cent. was salable. The average market price paid per bushel this season was as follows: Apple 50c., cherry \$3.

Considering the value of land, cost of trees, and necessary expense of planting and culture, apple, cherry and plum orchards are very profitable, but peach and pear are not.

Blight is doing a vast amount of damage to the apple tree, and especially where the ground is kept clean.

Insects: The canker worm, fall web-worm and codlin moth are damaging to the apple, both tree and fruit. The plum is infested with the tent caterpillar, and the following species are more numerous than of preceding years: Codlin moth, plum curculio, fall web-worm, handmaid moth, canker worm. The following species are less in number: Tree cricket, round-headed apple-tree borer, flat-headed apple-tree borer.

Vineyards: The grape matured 50 per cent. of a crop which was of good quality. The Concord is the most successful black variety; the Martha is the most successful white variety. The Concord is the best for market and family use.

Small Fruits: On March 1st, 1886, plantations of all classes were in a good condition. On November 1st, 1886, plantations of all kinds were in a good condition, excepting the strawberry, which was poor. The following list of varieties are generally the most successful in this county: Blackberry, early, Kittatinny, late, Snyder; currant, Red Dutch, White Grape; gooseberry, Houghton.

The acreage of fruit-planting in this county is annually increasing, and the general confidence of our people in the work of horticulture is increasing. Farmers are planting fruits for home uses.

RILEY COUNTY.—By T. C. WELLS, MANHATTAN.

(*Eastern portion.*)

Orchards: On March 1st, 1886, the apple and plum were in good condition, other classes poor. On November 1st, 1886, all classes of trees were in a good condition.

The following list of varieties are the most successful in tree and plant: Apple—Summer, Early Harvest, Hightop Sweet, American Summer; autumn, Maiden's Blush, Dominie, Jonathan; winter, Winesap, Ben Davis, Rawle's Genet, Bentley's Sweet, White Winter Pearmain. Cherry, Early Richmond, common and English Morello; plum, Wild Goose, Miner.

The following is the average market price paid per bushel during the season: Apple 50c., cherry \$1.75, plum \$1 to \$2.

Considering the value of land, cost of trees, and necessary expense of planting and cultivating, apple, cherry and plum orchards are profitable, others are not.

Blight has attacked the apple and pear trees, but was not so injurious as in years before.

Insects: The fall web-worm and codlin moth are working on the apple to a

greater extent than in previous years; the curculio is prevalent on the cherry and plum.

Vineyards: The grape crop was cut short by drouth. The following varieties are the most successful: Black, Concord, Cottage, Ives; red, Dracut Amber, Catawba, Delaware. The Concord is the best market and family variety. The average market price paid per pound in this market this year was 8c. to 4c. The following is a list of varieties preferred: Early, Cottage, Delaware; medium, Concord, Ives; late, Catawba, Goethe.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in good condition. The most successful varieties are as follows: Blackberry, early, Kittatinny; currant, Red Dutch, Versailles, White Grape; gooseberry, Pale Red; raspberry, medium, McCormick; late, Gregg, Shaffer; strawberry, early, Crescent; medium, Downing.

The acreage of fruit-planting is increasing in this county, and the general confidence of our people in the work of horticulture has not lessened during the past and present years. A majority of the farmers are planting fruits for home use.

(Western portion.—By A. Southwick, Riley Center.)

Orchards: On March 1st, 1886, the apple and plum were in a good condition; other classes were injured by the severe winter, but on November 1st following, the apple and plum were in a good condition; others were poor. The wood growth of 1886 was medium of the apple, peach, and plum; cherry and pear light.

Per cent. of failures since 1884: Apple probably 5 per cent., caused by drouth, freezing, want of cultivation, and insects; cherry and pear, not less than 10 per cent. nor more than 15 per cent., caused by drouth, freezing, and blight.

The apple, cherry and peach produce the best results on a north or northeasterly slope and a deep rich, porous subsoil land; the plum does the best on a rich moist soil.

The most successful varieties in this county in fruit and tree are as follows: Apple—Summer, Early Harvest, Carolina June, Red Astrachan; autumn, Maiden's Blush, Chenango, Rambo, Fameuse, Grimes's Golden; winter, Winesap, Ben Davis, Missouri Pippin, Jonathan, Willow Twig, Rawle's Genet, Rome Beauty, White Winter Pearmain, Gilpin. Cherry, Early Richmond, English Morello; peach, Amsden, Stump the World, Crawford's Early; pear, Bartlett; plum, Wild Goose.

Of the present year's crop, 60 per cent. of the apple was marketable. The average market prices paid per bushel this year were, for apples 75c. to \$1, cherry \$3, plum \$1.

Considering the value of land, cost of trees, and necessary expense of planting and culture, apple and cherry orchards are very profitable; peach, pear and plum are not.

There were not as many trees planted the past spring as in the year before.

Pear trees were somewhat injured by blight, especially the older trees.

Insects: The codlin moth has damaged the apple crop 30 per cent. The curculio slightly infested the cherry, and destroyed nearly the entire plum crop. The codlin moth and curculio have been increasing.

Vineyards: This season about 60 per cent. of a crop matured, the quality of which was poor. The Concord is the most successful, and the best market and family variety grown in the county. The average price paid per pound this season was 4c. Location of vineyards: Vineyards have done best in the past five years on a high north or northeast slope, with good, deep, rich, porous subsoil, moderate pruning, deep cultivation, and a liberal supply of wood ashes scattered broadcast over the land, and in dry seasons well mulched.

Small Fruits: On March 1st, 1886, the gooseberry and strawberry were in a fine condition; others were injured by the winter. On November 1st, 1886, plantations of all classes were in a good condition. Location and soil: The blackberry and raspberry produce the best on an elevated gentle slope, having a deep, rich, moist, well-drained soil; the strawberry should be on a moderate slope and a rich soil, which retains its moisture until the crop has thoroughly matured. The average market price paid per crate of the twenty-four boxes each was as follows: Blackberry and raspberry \$3.60, gooseberry \$2.40, strawberry \$6. The estimated yield per acre was as follows: Blackberry 60 bushels, gooseberry 200 bushels. The following varieties are the most successful in this county: Blackberry, early, Kittatinny; late, Snyder; currant, Red Dutch; gooseberry, Houghton; raspberry, late, Gregg; strawberry, early, Crescent, Wilson; medium, Sharpless.

Russian Fruits: On March 1st and November 1st, 1886, apple trees were in a good condition. The Oldenburg is the only variety that fruited this season.

The acreage of fruit-planting is steadily increasing in this county, and the general confidence of our people in the work of horticulture has not lessened during the past and present years. Farmers are planting orchards for their home uses.

ROOKS COUNTY.—By S. A. HEBREW, ROCKFORD.

Orchards: On March 1st and November 1st, 1886, trees of all classes were in a good condition. The wood growth of 1886 was medium of all classes, excepting the pear, which was light.

Per cent. of failures since 1884: Apple 25, cherry 30, caused by neglect; peach 90, plum 20, caused by freezing and attacks of borers. Of the spring planting, 5 per cent. of the apple, cherry, and plum failed; pear 10 per cent.

The apple and cherry produce the best results on a northeast slope and black soil; plum on a good gravelly soil.

The most successful varieties in this county in tree and fruit are as follows: Apple—Summer, Early Harvest, Red Astrachan, Summer Queen, Oldenburg; autumn, Maiden's Blush, Fall Wine, Rambo, Jonathan; winter, Ben Davis, Winesap, Willow Twig, Rome Beauty, Missouri Pippin, Jonathan. Cherry, Early Richmond; plum, Wild Goose, Damson, Yellow Egg.

The average market price per bushel of the apple was \$1.40, and plum \$2.25 to \$3.

I think apple, cherry and plum orchards will be in the future a profitable investment, considering the value of land, cost of trees, and necessary expense of planting, etc., but the peach and pear will not.

Grapes: The average market price paid per pound this season, was 8c.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in a good condition. The blackberry will produce best on a north slope and black soil; currant on a northeast slope having a black, sandy soil. The following varieties are most successful in this county: Blackberry, early, Early Harvest, Kittatinny, Early Cluster; late, Snyder, Taylor; currant, Red Dutch, Cherry, Fay's Prolific, White Dutch; gooseberry, Smith's, Downing; raspberry, early, Souhegan, Doolittle; medium, Cuthbert, Brandywine; strawberry, early, Sharpless, Crescent; medium, Wilson, Sharpless; late, Manchester.

Russian Apricot: On March 1st and November 1st, 1886, trees were in a good condition, the oldest being five years.

The acreage of fruit-planting in this county is annually increasing, and the people of the county have confidence in horticultural work. Farmers are planting fruit for their home uses.

RUSSELL COUNTY.—By J. B. CORBETT, BUNKER HILL.

Orchards: On March 1st, 1886, the apple, cherry and plum were in good condition; peach and pear were injured by the winter. On November 1st, 1886, trees of all classes were in good condition, excepting the peach, which was troubled by the root-borer.

Per cent. of failures since 1884: Apple, where properly cared for, not more than 15 per cent.; cherry 5 per cent., peach 75 per cent., caused by the severe winter, and depredations of the root-borer; pear and plum 25 per cent., caused by neglect.

Per cent. of failures in the spring planting: Apple and peach 10 per cent.; cherry 5 per cent.; pear and plum 20 to 25 per cent., caused by hailstorms more than any other cause.

The apple and cherry will produce best on an upland soil that has been cultivated deep, and barnyard manures applied freely; the peach will grow well on bottom or upland in this county, but needs protection; the pear and plum do best on sandy soils.

The following list of varieties are the most successful in this county in tree and fruit: Apple—Summer, Early Harvest, Carolina June, Maiden's Blush; autumn, Rambo, Fall Wine, Winesap, Lowell; winter, Missouri Pippin, Ben Davis, Willow Twig, Rhode Island Greening, Bentley's Sweet. Cherry, Early Richmond, Morello; pear, Howell, Bartlett; plum, Wild Goose, Sand.

The present year, 75 per cent. of the apple crop was marketable. Cherries sold for \$3.50 per bushel, and plums \$1.50 per bushel.

Considering the value of land, cost of trees, and necessary expense of planting and culture, orchards of all classes are profitable, excepting the peach.

The planting in the spring of 1886 was greater than in the preceding year.

Insects: The peach-tree borer is increasing in number.

Vineyards have produced best on a sandy loam, with plenty of moisture.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in good condition. Blackberries do the best on uplands well protected, on sandy loam or light soil, well mulched. The following varieties are the most successful in this county: Blackberry, early, Wilson's Early; medium, Kittatinny; currant, Red Dutch; gooseberry, Houghton; raspberry, medium, Red and Blackcap; strawberry, medium, Crescent, Wilson, Capt. Jack.

Russian Apricot: On March 1st, and November 1st, 1886, trees were in a fair condition.

The oldest trees planted are about 12 years old. The acreage of fruit-planting is annually increasing in this county. Our people are growing more confident that fruit raising will be a success. During the last two years farmers have been planting fruits for their own uses.

SHAWNEE COUNTY.—By H. W. LIPP, ROSSVILLE.

(*North of the Kansas river.*)

Orchards: On March 1st and November 1st, 1886, trees of all classes were in good condition. The wood growth of 1886 was strong of the apple, cherry and peach, pear light, plum medium.

The per cent. of failures since 1884 were very light. About 25 per cent. of the spring planting of 1886 failed, caused by the intense cold of the preceding winter. All classes of trees produce best on a southeastern slope and a black loam.

The most successful varieties in this county in tree and fruit are as follows: Apple—Summer, Early Harvest, Carolina June, Cooper's Early, Red Astrachan, High-top Sweet; autumn, Maiden's Blush, Rambo, Lowell, Jonathan, Grimes's Golden; winter, Ben Davis, Winesap, Missouri Pippin, Rawle's Genet, Willow Twig, Smith's

Cider, Rome Beauty, Gilpin, Dominie, Talman's Sweet. Cherry, Early Richmond; pear, Bartlett, Flemish Beauty, Buffum; plum, Wild Goose.

The present year 75 per cent. of the apple crop was marketable. The average market price paid per bushel was: Apple 60c., cherry \$1.90, plum \$1. All orchards, excepting the peach, are profitable, either for market or family use, considering the value of land and cost of trees, etc.

There were more trees of the apple, cherry and plum planted this year than last. Pear trees were slightly attacked by blight.

Insects: The codlin moth and fall web-worm have been prevalent and more numerous than in the preceding year.

Vineyards: The grape crop this season was about perfect in maturity and quality. The most successful black varieties in this county are the Early Victor and Concord; white, Elvira, Goethe. The Concord is the best market and family variety yet grown in this county. The average market price paid per pound this season was 2c. to 3c. Location: Vineyards have done best in the past five years on a black soil, planted in rows six feet apart and eighteen feet apart in the row, well cultivated, and trained on wire trellises. The following varieties are preferred: Early Victor, Concord, Ives, Elvira.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in a good condition. The most successful varieties in this county are: Blackberry, early, Kittatinny; late, Taylor; currant, Red Dutch, White Dutch; gooseberry, Houghton; raspberry, early, Doolittle; medium, Miami; late, Gregg; strawberry, early, Crescent; medium, Wilson.

The confidence of our people in the work of horticulture has been growing stronger each year, and farmers are planting fruits for general home uses.

(Central portion.—Thomas Buckman, Topeka.)

Orchards: On March 1st, 1886, plum trees were in a good condition; others were only in a fair condition. On November 1st, 1886, apple and cherry trees were in a fair condition, peach poor, pear and plum medium.

Per cent. of failures since 1884: Apple and pear 20, caused by blight and severe freezing; cherry 50, caused by severe winters. Per cent. of failures of spring planting: Apple 30, caused by neglect and borers; cherry and peach 10, caused by neglect and drouth.

Locations and Soils: The apple has succeeded best on an eastern or northern slope, deep soil, loose, porous subsoil, and good surface and sub-drainage; cherry, a western or northern slope; peach, on gravelly, loose soil, high prairie; plum, in a hog lot, or where the poultry can get at the fallen fruit, and destroy the curculio it contains.

The following varieties are the most successful in this county in tree and fruit: Apple—Summer, Early Harvest, Red Astrachan, Yellow June; autumn, Maiden's Blush, Fameuse, Porter, Rambo; winter, Smith's Cider, Ben Davis, Rawle's Genet, Missouri Pippin, Winesap. Pear, Seckel, Bartlett; cherry, Early Richmond; peach, Hale's, Amsden; plum, Wild Goose, Damson.

Thirty per cent. of the apple crop the present season was marketable. The average price paid per bushel for apples was 50c., and cherry \$1.

Considering the value of land, cost of trees, and necessary expense of planting and culture, apple, cherry and plum orchards are very profitable; peach and pear are too uncertain.

There were not as many fruit trees planted in the spring of 1886 as in the preceding year.

The pear blight was quite light the present season, and the plum crop was en-

tirely destroyed by the curculio. This insect was not as numerous as in the preceding year.

Vineyards: The Concord is the most successful black variety, Martha the most successful white variety, grown in the county. The former is the best variety for market and family uses. The average market price paid per pound for grapes this year was 3½c. Almost any location and soil will raise grapes, but the richer and deeper the soil the better. Rot was prevalent in 1885 among the grapes, but not the present season.

Small Fruits: On March 1st, 1886, plantations of all classes were in a good condition, excepting the raspberry, the canes of which were badly winter-killed. On November 1st, 1886, plantations of all classes were in a good condition, excepting the strawberry, which was injured by the drouth. The blackberry and raspberry produce the best crops grown on highland having a rich loamy soil. The following is the average price paid per crate of twenty-four boxes each for the fruit during the season: Blackberry and strawberry \$2. The estimated yield of the strawberry per acre was 200 bushels. The Crescent and Glendale varieties are the most successful.

The acreage of fruit-planting in this county is annually increasing, and farmers are planting for home purposes quite generally.

(Southern portion.—By Robert L. Hotze, Richland.)

Orchards: On March 1st and November 1st, 1886, trees of all classes were in good condition. The wood-growth of 1886 was medium of all classes, excepting the peach, which was light.

The per cent. of failure since 1884 was very light. Trees will produce the best results on a good porous or sandy subsoil.

The most successful varieties in this county are: Apple—Summer, Early Harvest, Red Astrachan, Carolina June; autumn, Maiden's Blush, Willow Twig; winter, Ortleigh, Yellow Bellflower, Ben Davis, Winesap. Cherry, Early Richmond, Morello; pear, Bartlett; plum, Wild Goose.

Of the apple crop of 1886, about 2 per cent. was marketable. The average market price paid per bushel: Apple 50 cents to \$1, cherry \$2.50 to \$3, pear \$3 to \$4.

Orchards of all classes are profitable, excepting the peach, which winter-kill too easily.

The spring planting of 1886 was about the same as in the previous year.

Insects: The codlin moth is prevalent in this part of the county.

Vineyards: Grapes are not grown very extensively here; the most successful, best market and family variety is the Concord, and the average price paid per pound in this market was 2½c. to 4c.

The age of the oldest-planted fruit trees in this county is 25 years. The acreage of fruit-planting in this county is annually increasing, and a general confidence prevails with the people in the horticultural work. Farmers are generally planting fruits for their home use.

SMITH COUNTY.—BY J. J. ANDERSON, STUART.

The following are the principal causes why horticulture has made so little progress in Smith county, as well as other counties in northwestern Kansas, in past years: First, want of experience in tree-planting; second, drouth; third, insect enemies; fourth, indolence and indifference of the settlers. Many of these settlers have been reared in timber countries, and their experience has been mainly in the line of cutting down and destroying the native forests for the purpose of clearing the land for agricultural purposes; many more have never owned or tilled a farm, and hence are novices on a Kansas prairie farm; others have filed upon land for speculative

purposes, and will sell out to the first buyer. With such a class of settlers, very little has been accomplished to determine the possibilities of the soil and climate. Besides these classes, there has been a certain class of scientists in the Eastern States, who could not let our settlers alone to pursue their course of reclaiming these wild prairies, but who have been teaching the public that nothing could be raised in western Kansas—continuously proclaiming it to be a desert waste. The untruthfulness of these assertions has been clearly demonstrated by the many forest groves and fruit orchards formed on the farms of our intelligent home-makers; and there are very few farms in the county on which there are not favorable places for fruit and forest plantations. Already there are fruit orchards bearing in Norton and Decatur counties, and shade trees around the court houses.

It is a settled fact that our rainfalls have increased; it may not be in the amount of water fallen, but in the frequency of its occurring, thus more evenly distributing it through the season. If such changes in the rainfall continue as in the past four or five years, this country will have all the water needed to make agriculture a complete success. I well remember that even in central Iowa, twenty-three years ago, drouths prevailed on those prairies to such an extent as to cause the belief that fruit and forest trees could not be grown there. The Iowa Legislature, by enactment, offered a bounty for successful tree-growing; and five years ago, when I moved from that State to this, the rainfall had so increased as to render living in that section decidedly unpleasant, but the wide-spreading, open prairie was covered with groves and forests as far as the eye could reach, and authority estimated the forest area to be increased fully three fold.

Northwestern Kansas has been favored with three years of prosperity (last past), during which all kinds of plants have flourished as never before. Rains have been evenly distributed throughout the growing season, and farmers, taking advantage of this condition, have planted fruit and forest trees and ornamental shrubbery around their homes, to beautify and make them comfortable. In fact, there has been more done in that line this season than ever before in this portion of the State.

The following is a partial list of the kinds of trees and shrubs now successfully grown in this part of Kansas: Fruit trees—Apple, peach, pear, plum, cherry, apricot; forest trees—ash (two kinds), ailantus, cottonwood (white and yellow), American sweet chestnut, elm (two kinds), catalpa (Western hardy), white maple, ash-leaved maple, mulberry (two kinds), dogwood, Osage orange, honey locust, black locust, oak (two kinds), black walnut, willow (two kinds), Lombardy poplar; evergreens—red cedar, Norway spruce.

Taking everything into consideration—cheapness of the seed, expenses of growing it, rapid and dense growth, endurance of drouth—the ash-leaved maple is among the few best for the construction of wind-breaks. I have been successful in growing the cottonwood and others of like character in the following manner: On all the lowlands in this county there is a spontaneous growth of scrub willow, which takes possession of the land. By cutting out these willows in the spring, and planting cuttings of cottonwood and others of like nature, or seeds, thereon, I have grown them into trees twenty feet high and from four to eight inches diameter, without any care or attention. I have black walnut trees growing on such land, now three years old from the seed, which are five to six feet high, and as thrifty as any in the county.

The people of western Kansas no longer fear to plant fruit and forest trees as heretofore, having learned by experience how to treat them successfully, viz.: Plant in April, cultivate thoroughly until the middle of June each year, then mulch heavily, which will keep the ground cool and moist until the fall rains.

Since the people have quit using the natural timber, its growth has increased very fast, and since the prairie fires have been stopped from sweeping over the land, in many places a young timber growth is starting up, where none has heretofore been known to grow. What little natural timber is used is from old and decaying trees; the young growth is rigidly guarded for a future use. It is only a question of a few years when western Kansas will be dotted over with orchards and groves, and grasses and grains will be easily grown on every farm.

TREGO COUNTY.—By W. B. KRITCHFIELD, WAKEENEY.

Orchards: On March 1st and November 1st, 1886, trees of all classes were in a good condition, excepting the peach, which was only medium. The wood growth of 1886 of the apple, cherry and peach was strong, pear medium, plum light.

Per cent. of the failures in the spring planting: Apple, 10 per cent., cherry 50, peach 20, caused by using poor stock. Fruit trees of all classes do best on a north-west slope and sandy loam. All classes are very profitable for both family and market purposes. The spring planting of fruit trees was large in 1886.

Vineyards: Grapes are not grown to any extent, but the Concord is the leading variety.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in a good condition. The following list is the most successful in this county: Blackberry, early, Kittatinny; late, Snyder, Lawton; currant, Red Dutch; gooseberry, Houghton; raspberry, Doolittle.

Russian Fruits: Apple and apricot trees, on March 1st and November 1st, 1886, were in a good condition. The oldest trees in this county are now three years.

The acreage of fruit-tree-planting is annually increasing in this county, and farmers are planting orchards for their home uses.

WASHINGTON COUNTY.—By E. R. WOLVERTON, BARNES.

(Eastern portion.)

Orchards: On March 1st and November 1st, 1886, all classes of trees were in good condition, except the peach, which was injured by the last winter. The wood growth of 1886 was strong of the cherry, medium of the apple, pear and plum, and light of the peach.

About 20 per cent. of trees failed in the spring planting of 1886, caused by using inferior stock when planting, and some because they were planted too late.

The most successful varieties in this county in fruit and tree are: Apple—Summer, Early Harvest, Carolina June, Early Pennock; autumn, Maiden's Blush, Fameuse, Grimes's Golden, Lowell; winter, Ben Davis, Missouri Pippin, Winesap, Jonathan, Willow Twig, Rawle's Genet. Cherry, Early Richmond, English Morello.

About 75 per cent. of the apple crop of the present season was marketable, and the average market price paid per bushel was \$1. Apple and cherry orchards are profitable, but the peach is not.

Blight is the only disease that has been prevalent, and it was not as severe this year as last.

Insects: The flat-headed borer and the tree cricket have been bad with the apple, more so than usual; the borer is always more numerous in a dry year. Codlin moth was more destructive than ever. Fall web-worm was more numerous than usual.

Vineyards: The vines matured 75 per cent. of a crop this season, but the quality was not very good, on account of sun-scald. The Concord is the only grape grown to any extent in this part of the county. The average market price paid per pound was 8c.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in good condition.

Since orchards are coming into bearing, people take more interest in their culture, and farmers are most all planting fruits for home uses; and some are planting for the market.

(Southern portion.—By J. B. Avery, Clifton.)

Orchards: On March 1st and November 1st, 1886, trees of all classes were in a good condition, and the wood growth of 1886 was medium. Of the apple, about 3 per cent. of the spring planting of 1886 failed.

A rolling upland, well-drained northeastern location has produced the best results generally with all classes of orchards.

The following varieties are the most successful in this county in tree and fruit: Apple—Summer, Early Harvest, Carolina June, Red Astrachan, Summer Queen; autumn, Jonathan, Maiden's Blush, Rambo, Lowell; winter, Winesap, Ben Davis, Missouri Pippin, Rawle's Genet, Willow Twig. Cherry, Early Richmond, common and English Morello; pear, Bartlett, Clapp's Favorite; plum, Wild Goose, Weaver.

This season 60 per cent. of the apple crop was marketable. Average market price paid per bushel: Apple 75c., cherry \$3, plum \$1.

Orchards of all classes are decidedly profitable.

Insects: Apples have been damaged to quite an extent by handmaid moth, flat-headed borer and canker worm; these species were more numerous than in the preceding year.

Vineyards: The grape matured 60 per cent. of a crop the present season, and it was fine in quality. The Concord is the most successful black variety and best market variety grown in this county. The Elvira and Pocklington are the most successful white varieties, and the Delaware is the best family grape grown. The average price paid per pound in the market this season was 6c.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in a good condition. The average market price paid per crate of twenty-four boxes each this season was: Gooseberry \$1.25, raspberry and strawberry \$2.50. The estimated yield per acre of the raspberry was 25 bushels, and of the strawberry 31½ bushels. The following varieties are the most successful: Blackberry, medium, Taylor; late, Snyder; currant, Red Dutch; cherry, Versailles, Fay's Prolific, White Dutch, White Grape; gooseberry, Houghton, Smith's, Downing; raspberry, early, Souhegan, Hopkins, Turner, Hansell; medium, Ohio; late, Gregg, Cuthbert; strawberry, early, May King, Crescent, Charles Downing; medium, Sharpless.

Russian Fruits: The apple cannot endure the severe cold winters and continuous hot summers as well as the more common varieties. The Red Astrachan is the only variety that fruited successfully this season. On March 1st, 1886, the apricot trees were in a poor condition. The oldest planted in this county is seven years.

The acreage of fruit-planting is annually increasing, and the confidence of our people in the work of horticulture has been strengthened each year. Farmers are planting fruits for home uses more generally.

(Central-western portion.—By Alex. Spiers, Linn.)

Orchards: On March 1st and November 1st, 1886, trees of all classes were in a good condition, excepting the pear, which was only fair. The wood growth of 1886 was medium.

Fruit trees of all classes will produce best results planted on highlands, and well protected by wind-breaks. The most successful varieties grown in this county, in fruit and tree, are: Apple—Early Harvest, Summer Queen, Cooper's Early.

In 1886, 90 per cent. of the apple crop was marketable, and sold for \$1 per bushel, cherries for \$5 per bushel.

Insects: The codlin moth was injurious to the apple this season, and is on the increase in numbers.

Vineyards: The grape was highly satisfactory in maturity and quality. The Concord is the best variety for all purposes, and is successful on both bottom and upland soils.

Small Fruits: On March 1st, 1886, plantations of all classes were in a good condition. On November 1st, 1886, plantations of all classes were in a good condition, excepting the strawberry, which was badly injured by the drouth. Small fruits succeed both on bottom or upland. Prices received for fruit crop in 1886: Raspberries sold for \$6 per crate of twenty-four boxes each; currants for \$3.60 per crate.

The acreage of fruit-planting is annually increasing in this county, and a general confidence in fruit-growing prevails with the people settled in this county. Farmers are planting fruits for home purposes.

WYANDOTTE COUNTY.—By FRANK HOLSINGER, ROSEDALE.

(*Eastern portion.*)

Orchards: On March 1st, 1886, the apple, pear and plum were in good condition, cherry and peach were injured. The condition of all classes of trees on November 1st, 1886, was bad, but the wood growth was strong of the pear, light of the cherry and plum, medium of the apple and peach.

Per cent. of failures since 1884: Of the apple and plum, 10 per cent., caused by severe winter and drouth following; pear, 25 per cent., caused by blight. The per cent. of failure in the spring plantings was heavy, and caused by drouth.

Location and Soil: The apple does best on a high, alluvial soil; cherry, pear, and plum, on a high, dry, exposed location.

The following varieties are the most successful in this county in tree and fruit: Apple—Summer, Early Harvest, Oldenburg, Mother; autumn, Grimes's Golden, Jonathan, Wine, Fulton; winter, Ben Davis, York Imperial, Gano, Willow Twig, Wine-sap, Rawle's Genet. Peach, Alexander, Old Mixon Free, Crawford's Early, Heath Cling, Chinese Cling; pear, Bartlett, Winter Nelis, Seckel, Howell; plum, Wild Goose, Miner.

Of this year's apple crop, about 75 per cent. was marketable. The average price paid per bushel this season was: For apples 50c., cherry \$4, pear \$2.50, plum \$3.50.

Considering all costs of growing, the apple, cherry and plum are profitable, other classes are not.

Insects: The codlin moth, crown borer and apple curculio infested the apple; the plum curculio the cherry and plum crop to a small extent. The plum gouser destroyed many of the plums. Peach and apple-tree borers were more numerous than in previous years.

Vineyards matured 70 per cent. of a crop. The Concord is the best black grape, the Elvira, white grape, and are preferred for market and family purposes. The average price paid per pound in this market was 5c. Vineyards seem to do best on hillsides well drained. The Ives is preferred for an early variety.

Small Fruits: On March 1st, 1886, plantations of the blackberry, currant and gooseberry were in a fine condition; raspberry, medium; strawberry, poor. On November 1st, 1886, the blackberry and gooseberry were in a good condition; currant and raspberry, very poor; strawberry, medium. The blackberry does the best on a north slope with good soil; currant, on a northern exposure, and shaded on the south; gooseberry, on a south slope well drained. The average prices paid per crate

of twenty-four boxes each were as follows: Blackberry \$3.50, currant, gooseberry, and raspberry \$3, strawberry \$2.50. The average receipts per acre were: Blackberry and currant \$300, gooseberry \$350, raspberry \$175; strawberry \$200. The most successful varieties in this county are: Blackberry, early, Early Harvest; medium, Kittatinny; late, Snyder, Taylor; currant, Red Dutch, Cherry, Versailles, Red Grape, and White Grape; gooseberry, Houghton, Mountain, Smith; raspberry, early, Hansell, Doolittle, Hopkins; medium, Hopkins, Tyler, Souhegan; late, Gregg, Thwack; strawberry, early, Crescent; medium, Charles Downing; late, Sharpless.

(*Western portion.—By H. H. Kerns, Bonner Springs.*)

Orchards: On March 1st, 1886, trees of all classes were not in a satisfactory condition. On November 1st, 1886, all classes were in a fair condition. The wood growth of 1886 was light of all classes but the plum, which was medium.

The per cent. of failures since 1884 was very heavy; trees suffered severely from the extreme cold winter preceding. The plum endured the cold better than any class of trees planted. Per cent. of failures of the spring planting: Apple, pear and plum, 33 per cent., caused by drouth, carelessness in planting; and neglect of cultivation; cherry and peach, 50 per cent.

Location and Soil: The apple succeeds best on a northern and eastern slope, deep sandy loam and a clay subsoil. Timber or brush land is preferred; cherry on an eastern or northern slope, loam or sandy soil, gravel subsoil; peach, eastern or northern slope, sandy soil, not too rich; prairie loam is not good for peach—the higher the location the better; pear (dwarfs), succeed best on a moist soil, northern or eastern slope, sandy loam, clay subsoil or reddish shale soil is preferred; plum, Wild Goose, should be planted on northern slope, if possible, and near a poultry range or building.

The following varieties are the most successful in this county in tree and fruit: Apple—Summer, Carolina June, Early Harvest, Keswick Codlin, Red Astrachan; autumn, Maiden's Blush, Jonathan, Oldenburg, Rambo, Fameuse; winter, Winesap, Ben Davis, Smith's Cider, Willow Twig, Missouri Pippin, Rawle's Genet, Rambo, Huntsman's Favorite. Cherry, English Morello, Montmorency; pear, Early Harvest, Osband's Summer, White Doyenne, Bartlett, Flemish Beauty, LeConte, Louise Bonne de Jersey, Seckel, Angouleme, Vicar; plum, Wild Goose, Golden Beauty, Blackburn, Miner, Lawrence.

The present year about 50 per cent. of the apple crop was marketable. The following is the average price paid per bushel this year: Apple 40c., cherry and pear \$3, plum \$2.50 to \$3.50.

All things considered, an apple orchard can be made profitable, and other classes are some seasons.

There was a decrease of at least 30 per cent. in the extent of planting this spring.

The apple and pear were attacked by blight, and the plum by the black knot, this season.

Insects: The codlin moth and borers have been damaging to the apple; the woolly aphis and curculio have infested the cherry; the curculio infested the plum. None of the above-named species are as numerous as in years before.

Vineyards: About 75 per cent. of the grape crop matured this season, and the quality was better than usual. About 25 per cent. was ruined by rot. The following varieties are the most successful: Black, Concord, Norton's Virginia, Ives, Moore's [Early]; red, Brighton, Dracut Amber; white, Elvira, Goethe, Pocklington. The Elvira and Concord are the best varieties for family and market purposes. The average price paid per pound this season was 4 cents. Vineyards do best on an eastern or southeastern slope or on a hillside, sandy loam having a porous subsoil. The

following is a preferred list of varieties: Brighton, Dracut Amber, Moore's [Early], Concord, Elvira, Goethe, Norton's Virginia. A remedy to prevent rot: Powdered sulphur and lime sprinkled over the vines and earth when wet with dew.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in good condition. Location and soil: The blackberry does best on a rich loam, no difference as to location; currant, on north side of a hill, requires partial shade; gooseberry, on a northern slope, as they bloom early in the spring and are killed by late frosts; raspberry, red-clay subsoil, enriched, no difference in location; the strawberry grows well on any rich soil, a southern slope for early varieties, northern for the main crop. The following is the average price paid per crate of twenty-four boxes each: Blackberry \$3.50, gooseberry and strawberry \$2, raspberry \$3. The following varieties are the most successful in this county; Blackberry, early, Dorchester; medium, Kittatinny, Lawton; late, Snyder; currant, Red Dutch, Cherry, White Dutch, White Grape; gooseberry, Mountain, Downing; raspberry, early, Hopkins, Turner, Davison, Shaffer; medium, Miami, Cuthbert, Reliance; late, Gregg; strawberry, early, Crescent, Ironclad, Cumberland [Triumph]; medium, Chas. Downing, Ironclad, Wilson; late, Parry, Capt. Jack, Windsor Chief, James Vick, Glendale.

Russian Fruits: On March 1st, 1886, apple trees were in a fine condition. The Tetofsky and Oldenburg fruited successfully the past season. On March 1st and November 1st, 1886, apricot trees were in a fine condition.

The acreage of fruit-planting has decreased in the last two years, but farmers are planting fruits for general home uses.

CENTRAL DISTRICT.

ANDERSON COUNTY.—By JOSH. TAYLOR, RICHMOND.

Orchards: On March 1st and November 1st, 1886, trees of all classes were in a good condition, and the wood growth was light to medium.

Since 1884, a very small per cent. failed, and very few spring plantings failed.

Location: A north or northeastern slope with a rich soil is the preferred location for all classes.

The most successful varieties in this county are: Apple—Summer, Early Harvest, Carolina June, Hightop Sweet, Chenango; autumn, Maiden's Blush, Lowell, Jeffries, Fameuse, Jonathan; winter, Winesap, Rawle's Genet, Rome Beauty, Ben Davis, Hubbardston, Missouri Pippin. Cherry, Early Richmond, English Morello; pear, Belle Lucrative, Flemish Beauty, Angouleme; plum, Wild Goose.

Of the apple crop of 1886, about 75 per cent. was marketable. The average market price was 40c per bushel.

All things considered, the orchards of all classes are profitable, excepting the peach.

Fruit-planting was more extensive in the spring of 1886 than of the preceding year.

Insects: The round-headed apple-tree borer seems to be on the increase this season.

Vineyards: About 75 per cent. of the grape crop matured, but was of medium quality. The Concord, Hartford, Ives and Dracut Amber are the most successful varieties. The Concord is the best market and family grape. The average price

paid per pound for the fruit this season was 4c. For a vineyard, an upland, limestone soil, having a south or southeast slope, seems to produce the best results.

Small Fruits: On March 1st, 1886, all plantations were in good condition, excepting the blackberry and raspberry, which were injured by the severe winter. , On November 1st, 1886, plantations of all classes were in good condition, excepting the raspberry. The blackberry does the best on any well-drained soil; raspberry on rich soil, and any location. The average market price paid per crate of twenty-four boxes this season was as follows: Blackberry \$3.60, strawberry \$2.40. The estimated yield in bushels per acre of the strawberry was 100. The most successful varieties in this county are as follows: Blackberry, Kittatinny; currant, Red Dutch; gooseberry, Houghton, Downing; raspberry, early, Hopkins; medium, McCormick; late, Gregg; strawberry, early, Crescent; medium, Capt. Jack, Chas. Downing; late, Windsor Chief, Glendale.

Russian Fruits: On March 1st and November 1st, 1886, the apple was in good condition.

The acreage of fruit-planting is annually increasing in this county, and the general confidence of our people in the work of horticulture has not lessened during the past two years, and farmers are planting fruits for home uses.

BARTON COUNTY.—By F. W. BESTER, FAWNEE ROCK.

(*West half.*)

Orchards: All classes of fruit trees were in good condition on March 1st, 1886, excepting the peach, which was injured during the preceding winter. On November 1st following, all classes were in good condition.

The failures of trees since 1884 have been light, and mainly caused by attacks of borers and extreme cold winters. In the spring planting of 1886 there were no failures only among trees that had been shipped in from a distance, which were generally dead before delivered.

Location: All classes thrive best on upland facing to the north. Second bottoms are quite successful.

The following is a list of varieties which have proven successful in this county: Apples—Summer, Early Harvest, Red Astrachan, Cooper's Early; autumn, Maiden's Blush, Rambo, Fameuse; winter, Ben Davis, Missouri Pippin, Jonathan, Rawle's Genet, Winesap. Cherry, Early Richmond, May Duke; peach, Alexander, Crawford's Early, Rivers, Old Mixon Free, Family Favorite (?), Crimson Beauty (?); pear, Clapp's Favorite, Bartlett, Flemish Beauty, Kieffer, Vicar, Winter Nelis; plum, Wild Goose, Miner.

The apple crop matured properly for market with scarcely a loss. Prices paid for fruit per bushel: Apple \$1, plum \$1.50. The other classes did not yield any surplus.

Apple, cherry, pear and plum orchards are profitable in this county.

Diseases: None have yet appeared among the orchards.

Insects: The borer and codlin moth are present with us, and seem to follow the tread of the settler. A few plum curculio have been found.

Vineyards: This fruit is successful. The crop in 1886 was good, and matured without loss. Concord leads for all general purposes, but the Ives, Catawba and Martha are very promising. The fruit sold in our market the present season at 8c. per pound. The rot or mildew have not yet appeared.

Small Fruits: The condition of plantations was good on March 1st and November 1st, 1886. All classes thrive on a sandy loam. Prices paid in the market per bushel: Gooseberries \$1.20, raspberries \$4.80, strawberries \$4.80. Estimated yield per acre:

Gooseberry 375 bushels, raspberries 80 bushels, strawberries 85 bushels. List of most successful varieties: Raspberry, early, Tyler, Souhegan; medium, McCormick, Turner; late, Gregg; strawberry, early, Crescent, Canada; medium, Capt. Jack, Chas. Downing, Sharpless; late, Kentucky, Jumbo.

Russian Fruits: Apple—The condition of the trees on March 1st and November 1st, 1886, was good, but no better than our common kinds in hardiness. Apricot: The trees are hardy to date, but the fruit trees were killed by the cold of the last winter as extensively as those of the peach.

The acreage of fruit-planting is annually increasing, and the people have great confidence in the future success of fruit culture. Farmers are generally planting fruits for family use.

(East half.—By Levi Gunn, Great Bend.)

Orchards: The condition of all classes of fruit trees was good on March 1st, and November 1st, 1886, and the wood growth was fair to good. Of the spring planting the failures were light, and these generally occurred from a bad condition of the trees used. All classes seem to succeed best on a northern slope.

The following is a list of varieties which are most successful: Apple—Summer, Carolina June, Red Astrachan; autumn, Maiden's Blush, Rambo; winter, Ben Davis, Jonathan, Willow Twig, Winesap, Rawle's Genet. Cherry, Early Richmond, Morello; plum, Wild Goose; pear, Edmond, Bartlett, Flemish Beauty; grapes, Concord.

Small Fruits: Plantations of all classes were in a very good condition on March 1st, 1886, and on November 1st, following. The Kittatinny blackberry, Houghton gooseberry, Souhegan raspberry, and Crescent strawberry are most successfully grown.

Each year shows a greater confidence in horticulture in this county, by the increased acreage, and farmers are generally planting fruits of all kinds for family purposes.

CHASE COUNTY.—By J. W. BYRAM, CEDAR POINT.

Orchards: On March 1st and November 1st, 1886, trees of all classes were in good condition, excepting the peach, which was winter-killed. The wood growth of 1886 was strong of the pear, light of the apple and peach, medium of the cherry and plum.

Since 1884 the apple has failed 5 per cent., on account of borers and the severe winters; peach about 60 per cent., caused by the severe winters. The per cent. of failures in the spring planting of 1886 was as follows: Of the apple about 10 per cent., cherry and pear 5 per cent., plum 4 per cent., caused by drouth. Orchards of all classes have given satisfactory results during the past years on bottom lands, with timber belt on south side.

The most successful varieties in this county in tree and fruit are as follows: Apple—Summer, Yellow Transcendent, Early Harvest, Carolina June, Red Astrachan, Cooper's Early; autumn, Maiden's Blush, Fall Wine, Rambo, Lowell, Autumn Swaar; winter, Jonathan, Rome Beauty, Winesap, Ben Davis, Westfield Seek-no-further, Rawle's Genet, Willow Twig, Newtown Pippin, English Rambo. Cherry, Early Richmond, English Morello; pear, LeConte, Osband's Summer, Clapp's Favorite, Bartlett, Angouleme, Flemish Beauty, Seckel, White Doyenne, Sheldon, Winter Nelis; plum, Wild Goose, Miner.

About 60 per cent. of the apple crop in 1886 was marketable. The average market price paid per bushel this season was as follows: Apple 50c., cherry and pear \$3, plum \$2.75.

Considering all things, orchards are profitable.

In the eastern part of the county, pear blight prevailed to some extent.

Insects: The round-headed borer, codlin moth, fall web-worm, canker worm and handmaid moth infested the apple this season; the fall web-worm, the cherry tree; tree cricket, the pear; curculio, the plum. The codlin moth and flat-headed borer were 20 per cent., and the fall web-worm 50 per cent. more numerous this season than last.

Vineyards: Grape-vines matured 20 per cent. of a crop less than last year, but quality was better. The following varieties are the most successful in this county: Black, Worden, Concord, Moore's [Early]; red, Brighton, Salem, Delaware; white, Jefferson, Vergennes. Moore's [Early] is the best market variety, Brighton the best family variety. Average market price paid per pound this season was 8½c. Location: For the past five years, vineyards have produced the best results on deep loam soil, the plants set in trenches three feet wide and three feet deep. The following varieties are preferred: Early, Moore's [Early]; medium, Brighton, Worden, Martha, Concord; late, Vergennes, Jefferson.

Small Fruits: On March 1st plantations of all classes were in a good condition excepting the blackberry and raspberry, which were injured by the winter. On November 1st, 1886, plantations of all classes were more or less injured by the drouth. Small fruits do best on lowlands. The average market price paid per crate of twenty-four boxes each was as follows: Blackberry and strawberry \$3, gooseberry \$2, raspberry \$3.60. The most successful varieties in this county: Blackberry, early, Early Harvest; medium, Kittatinny; late, Snyder; currant, Red Dutch, White Dutch; gooseberry, Houghton, Downing, Smith; raspberry, early, Souhegan, Hopkins, Tyler; medium, Ohio, Centennial; late, Gregg, Shaffer; strawberry, early, Crescent; medium, Capt. Jack, Chas. Downing; late, Kentucky, Glendale.

Russian Apricot: On March 1st and November 1st, 1886, trees were in a fine condition. The oldest planted trees in the county are on their eighth year.

The acreage of fruit-planting in this county is largely increasing, and the confidence of our people in the work of horticulture is strengthening each year. Farmers are generally planting fruits for home uses.

COFFEY COUNTY.—By JOHN BEAVER, OTTUMWA, AND O. B. TANNER, BARRY.

Orchards: Condition of trees on March 1st, 1886, was good of all classes excepting the peach, which was largely killed by the preceding winter. The condition on November 1st following was good. Wood-growth in 1886, medium of all classes excepting of the young peach trees, which was light to good.

Failures in trees since 1884 were light of all classes excepting the peach, which was heavy; of the planting in the spring of 1886, light.

Preferable location and soil: The apple thrives best on a north or northeast slope; cherry, on most any location; pear, near the dwellings, and where possible select an eastern slope, having a rich dry soil; plum, in or about the range of poultry, on good clay soil.

The following is a preferred list of the several classes most successful in tree and fruit for the county: Apple—Summer, Early Harvest, Cooper's Early, Yellow June, Red Astrachan, Carolina June; autumn, Maiden's Blush, Chenango, Lowell, Porter, Winter, Ben Davis, Missouri Pippin, Winesap, White Winter Pearmain, Jonathan, Rawle's Genet, Willow Twig, Limber Twig. Cherry, Early Richmond; pear, Early Harvest, Summer Doyenne, Clapp's Favorite, Seckel, Winter Nelis, Bartlett, Flemish Beauty; plum, Wild Goose, Miner.

About 50 per cent. of the apple crop of 1886 was marketable. Bottom lands yielded the best product. Average price paid in the market per bushel: Apple 50c., cherry \$2.25, pear \$2.50, plum \$1.25.

Apple, cherry, pear and plum orchards are profitable in this county, but do not recommend planting the pear or plum in large lots.

Diseases: None have been seriously damaging. Apple trees have shown a few cases of twig blight only, but in a very light form. The same has been observed among pear trees.

Insects: The canker worm, codlin moth and plum curculio have been noticed, but are not prevalent. In neglected orchards the fall web-worm has been found.

Vineyards: The crop in 1886 was some less than a full one, but the quality was good. List of varieties most successful: Black varieties, Concord and Hartford. The first is the best for family and market uses, and sold the past season in our market at an average of 5c. per pound. The grape-vine succeeded best on a high, rich well-drained land, and protected on the south from winds. Trellises are the best supports, and a moderate pruning and mulching are beneficial. Diseases: Rot was quite damaging in 1885, but not so in 1886. No cases of mildew on the leaf have been noticed.

Small Fruits: Condition on March 1st, 1886, good of all classes excepting the blackberry, the cause of which was the injury of some plantations by the cold of preceding winter. On November 1st, 1886, all classes were in good condition, excepting the strawberry, which had suffered from drouth. Blackberry thrives the best on well-drained land, and where protected from north wind; currant, where partially shaded; gooseberry, on most any situation; raspberry, see blackberry; strawberry, on elevated, rich clay land. Average market price in 1886 per crate of 24 boxes: Blackberry \$2.20, gooseberry \$1.75, raspberry \$2.20, strawberry \$1.87½. List of most successful varieties: Blackberry, early, Kittatinny; late, Snyder; gooseberry, Houghton; raspberry, early, Doolittle, Souhegan; medium, Gregg; late, Gregg, McCormick; strawberry, early, Crescent, Charles Downing; medium, Sharpless; late, Kentucky.

Russian Apricot: Trees were in a good condition on March 1st, 1886, but made a light growth during the season.

The acreage of fruit-growing has been increasing, and the interest of the people in the pursuit has not lessened. Farmers are generally planting the various classes to supply fruits for their families.

DOUGLAS COUNTY.—BY C. H. LOVEJOY, BALDWIN CITY.

Orchards: On March 1st, 1886, the apple, cherry and plum were in a good condition, others were damaged. On November 1st, 1886, all classes of trees were in a good condition, and the current year's wood growth was very light.

The failures since 1884 were medium of all classes. Of the spring planting, the failures were light of all classes.

The most successful location and soil for all classes is a rich surface loam, with a stiff clay or gravelly subsoil.

The following is a list which are successful in the county: Apples—Summer, Early Harvest, Cooper's Early, Red Astrachan, Hightop Sweet, American Summer; autumn, Maiden's Blush, Lowell, Porter, Hays, Wine, Fameuse, Jonathan; winter, Winesap, Ben Davis, Missouri Pippin, Willow Twig, Red Winter Pearmain, Westfield Seek-no-further. Cherry, Early Richmond, English Morello; pear, Bartlett, Angouleme, Howell, Seckel, Sheldon; plum, Wild Goose, Miner.

The average market price paid per bushel was as follows: Apple 30c., cherry \$2, pear \$1.50, plum \$1.

Considering the value and expense of orchards, they are very profitable.

The planting in the spring of 1886 was larger than of preceding years. Apple and pear trees were somewhat afflicted the past season with twig-blight.

Insects: The apple has been damaged slightly by the codlin moth and tree cricket;

they are on the increase in some localities. The plum has been attacked by the curculio.

Vineyards: About 75 per cent. of the crop matured, but it was poor in quality. The following list is the most successful in this county; Black, Concord, Ives, Norton, Worden; red, Dracut Amber, Catawba, Delaware; white, Martha, Ann Arbor. The Concord is the best family and market variety grown in the county. The average market price paid for grapes was 2½c. per pound. Vineyards produce the best results on a high red loam, with good cultivation. The following list is preferred: Concord, Worden, Ives, Norton, Catawba. On lowlands, the rot has been prevalent to a slight extent.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in a very fine condition, excepting the blackberry and gooseberry. All classes do very well on a rich, upland, porous loam, having a western slope. The average market price paid in our market per crate of twenty-four boxes each was as follows: Blackberry, raspberry and strawberry, \$2.40; currant and gooseberry, \$1.40. The following is the estimated yield of bushels per acre: Blackberry, 50; currant 150 to 200; gooseberry, raspberry and strawberry, 200. The following are the most successful varieties in this county: Blackberry, Snyder, Wilson, Kittatinny, Lawton; currant, Cherry; raspberry, Tyler, Souhegan, Davison, Gregg, Doolittle, McCormick, Seneca; strawberry, Crescent, Chas. Downing, Cumberland, Capt. Jack, Glendale, Old Ironclad, Windsor Chief.

Russian Fruits: On March 1st and November 1st, 1886, the apple was in a fine condition; the Red Astrachan was the only one fruited. On March 1st and November 1st, 1886, the apricot was in a fine condition. The age of the oldest planted trees in this county is fifteen years.

The acreage of fruit-planting is largely increasing in this county, and farmers are planting for their own home use. The general confidence of our people in the work of horticulture has not lessened during the past and present years.

FRANKLIN COUNTY.—BY JUDSON WILLIAMS, OTTAWA.

Orchards: On March 1st, 1886, trees of all classes were in a good condition, excepting the apple and peach, which were damaged a little. On November 1st, 1886, trees of all classes were in a good condition, excepting the cherry. The wood growth of the current year was from light to medium.

The failures since 1884 were very light, and a very small per cent. of the spring planting failed. All classes do best on a northern location with light to deep sandy or red loamy soil having a porous clay subsoil.

The following is a list of successful varieties in this county in tree and fruit: Apple—Summer, Early Harvest, Carolina June, Red Astrachan, Lowell; autumn, Maiden's Blush, Mother, Jonathan, Porter, Chenango, Grimes's Golden; winter, Missouri Pippin, Ben Davis, Willow Twig, Rawle's Genet, Gilpin, Winesap, Smith's Cider, Rome Beauty, Red Winter Pearmain. Cherry, Early Richmond, English Morello; peach, summer, Amsden, Alexander, Nugent's June; autumn, Heath Cling, Crawford's Late, Stump the World; pear, Sheldon, [Beurre de] Anjou, Angouleme, Seckel, Howell, Vicar, Kieffer; plum, Wild Goose, Rogers.

About 50 per cent. of the apple crop of 1886 was marketable. The average market price paid per bushel for fruit was as follows: Apple 45c., cherry \$1.75, pear and plum \$2.50. Apple, cherry and plum orchards are very profitable, others are not.

The spring planting of 1886 was larger than that of the preceding years. Apple and pear trees were injured by blight.

Insects: Flat-headed borers and tree crickets have injured the apple more this year than ever before. The codlin moth worked on the pear, but not as much as usual. The plum curculio and gouger are not as bad as usual. The fall web-worm and handmaid moth are worse than ever before.

Vineyards: About 50 per cent. of the grape crop was marketable, but the quality was very poor. The following are the most successful varieties: Moore's [Early], Worden, Concord, Early Victor, Clinton, Norton, Dracut Amber, Agawam, Pocklington, Lady, Noah, Elvira. For market varieties the Worden, Dracut Amber and Concord are the best; for family use, the Moore's Early, Lady, and Noah. The average market price was 3c. per pound. Location: Vineyards do best on light sandy ridges, with a southern or eastern slope, trained on wire trellis, given a careful annual pruning and clean cultivation. The following varieties are preferred: Early Victor, Moore's [Early], Worden, Concord, Norton. Last year about 80 per cent. of the crop was destroyed by rot, and this year about 20 per cent.

Small Fruits: On March 1st, 1886, plantations of all classes were in good condition, excepting the blackberry. On November 1st, 1886, plantations of all classes were in a good condition. The blackberry and raspberry produce best results on a rich deep soil well-drained and sloping to the north; currant and gooseberry on a well-drained soil with southern protection; strawberries do best on a clay loam. The average market price paid per crate of twenty-four boxes each was as follows: Blackberry and raspberry \$3, gooseberry \$1.50, strawberry \$2.25. The following is the estimated yield of quarts per acre: Blackberry 1,000, gooseberry 1,500, raspberry 900, strawberry 3,500. The following is a list of successful varieties: Blackberry, Snyder, Taylor, Kittatinny, Wilson; currant, Red Dutch; cherry, Naples; gooseberry, Houghton, Smith; raspberry, Hopkins, Souhegan, Tyler, Turner, McCormick, Reliance, Cuthbert, Thwack, Gregg, Shaffer; strawberry, Crescent, Downing, Miner, Windsor Chief, Cumberland, Glendale.

Russian Fruits: The Red Astrachan and Oldenburg fruited successfully the present year.

The acreage of fruit-planting is annually increasing in this county, and the farmers are planting fruits for their home uses.

HARVEY COUNTY.—BY M. HALL AND R. W. CRANDALL, NEWTON.

Orchards: The condition of cherry and plum trees was good, apple fair, peach poor, on March 1st, and good of all classes on November 1st, 1886. The season's wood growth in 1886: Apple, cherry, peach, good; pear, fair; plum, very strong.

Losses since 1884 were light, caused by neglect and severe cold winters. Failures in spring planting were light, and were occasioned mainly by drouth.

Location: High, well-drained land is most successful for orchards.

The following list embraces the most successful varieties: Apple—Summer, Early Harvest, Carolina June, Red Astrachan, Cooper's Early, Chenango; autumn, Maiden's Blush, Rambo, Lowell, Dominie, Haas, Summer Queen; winter, Ben Davis, Winesap, Missouri Pippin, Willow Twig, Rawle's Genet, Rome Beauty, Jonathan, Huntsman's Favorite, Smith's Cider, Talman's Sweet. Cherry, Early Richmond, Large Montmorency, May Duke; peach, Amsden, Governor Garland, Alexander, Early York, Early Crawford, Indian Blood Cling, Old Mixon Free, Old Mixon Cling, Stump the World, Crawford's Late, Heath Cling, Lemon Cling; pear, Bartlett, Summer Doyenne, Louise Bonne de Jersey, Osband's Summer, Early Harvest, Seckel, White Doyenne, Dearborn, Kieffer, Angouleme, Clapp's favorite, Howell, Flemish Beauty, Vicar, Mount Vernon, Sheldon; plum, Wild Goose, Weaver, Chickasaw, Miner.

The apple crop in 1886 was fair, but not up to market grade as in previous years. Prices paid per bushel: Apples 75c. to \$1, cherry \$3.50 to \$4; pear \$4 to \$5, plum \$2.

Apple, pear, plum and cherry orchards are a profitable investment in this county.

Diseases: Pear blight only has been noticed in the orchards.

Insects: The codlin moth, borers and curculio are present, but not numerous, yet they are increasing.

Vineyards: The crop in 1886 was medium in quantity but good in quality. List of successful varieties: Black varieties, Champion, Concord, Moore's Early, Hartford, Clinton, Ives; red varieties, Delaware, Salem, Catawba, Diana, Agawam; white, Martha, Elvira, Niagara, Lady, Pocklington. Best varieties for market, Concord, Champion Salem, Martha; for family, Concord, Hartford, Salem, Martha. Grapes sold in our market the past season at 7c. per pound. Vineyards succeed best on high rolling land and a deep sandy soil. They should be well cultivated each year, and the land given a good surface dressing with well-rotted manure. Trellising has proven to be the best support for the vine, and should be constructed north and south. Rot has not been troublesome in our vineyards.

Small Fruits: Plantations were in good condition on March 1st, 1886, excepting of the blackberry, the canes of which were partially winter-killed. All were in good condition on November 1st excepting the strawberry, which had suffered from the season's drouth. Small fruits succeed on any good soil that does not retain surplus water. Prices paid in the market for the fruit during the season per crate of twenty four quarts each: Blackberries \$3, currants \$3, gooseberries \$1.75, raspberries \$3.25, strawberries \$3. Estimated yield of fruit per acre: Blackberries 30 bushels, raspberries 100, strawberries 60. The following is a list of varieties which succeed in the county: Blackberry, Wilson jr., Kittatinny; currant, Red Dutch, White Grape, Fay's Prolific; gooseberry, Houghton, Smith; raspberry, early, Souhegan, Doolittle; later, Gregg, Miami.

Russian Fruits: Apricot trees were in good condition on March 1st, 1886, and November 1st following. The bloom was killed by the cold of last winter, and therefore did not fruit.

The acreage of fruit-planting is increasing, and our people have full confidence in the success of horticulture in the county. Farmers generally are planting to provide their families with an abundance of fruit in the near future.

HODGEMAN COUNTY.—By HENRY EBERLE, ARTHUR.

Orchards: All classes of fruit trees were in good condition on March 1st and November 1st, 1886, and the current year's growth was fair.

Losses in the spring planting were very heavy, owing to a disastrous hailstorm which swept the county on June 17, 1886.

Orchards are most successful on sandy loam on upland.

List of varieties promising success: Apples—Summer, Sops of Wine, Carolina June; autumn, Maiden's Blush, Rambo, Hubbardston, Oldenburg; winter, Ben Davis, Winesap, Missouri Pippin, Rawle's Genet, Smith's Cider, Stark. Cherry, Early Richmond, English Morello; peach, Alexander, Crawford's Early, Early York, Wheatland, Stump the World; pear, Bartlett, Clapp's Favorite, LeConte.

Not any diseases or insects are found here which are damaging to trees.

Vineyards: The current year's crop was destroyed by a hailstorm. The black varieties, Concord, Moore's [Early], and red, Agawam, Salem, and white, Goethe, Martha, Prentiss and Elvira have been successful. Grape-vines should be planted on sandy loam, and in locations having a southwestern exposure, and given clean cultivation.

Small Fruits: All classes were in good condition on March 1st and November 1st,

1886. The Houghton gooseberry, Souhegan and Gregg raspberry, and Crescent, Sharpless and James Vick strawberry, have fruited successfully in the county.

Russian Fruit: The apple and apricot trees are hardy. The last-named fruited for the first time this year.

The acreage of fruit-planting is annually increasing, and the people firmly believe that fruits can be successfully grown in the county.

JOHNSON COUNTY.—By E. P. DIEHL, OLATHE; A. W. JEWETT, DE SOTO.

Orchards: All classes of fruit trees were in good condition on March 1st, 1886, excepting the peach. On November 1st following, all were in good condition in the western portion of the county, excepting the peach and pear; those in the eastern portion were reported poor. The current year's wood growth was only fair throughout the county.

Losses of the trees in orchards, planted before 1884, are reported as heavy since that date, occurring from drouth and intense cold. Losses in the current year's planting were about twenty per cent. of the apple, caused by drouth.

A northern slope, having a porous soil well drained, is recommended as best for an orchard.

List of varieties successful in tree and fruit: Apple—Summer, Early Harvest, Carolina June, White Catlin, Red Astrachan, Hightop Sweet; autumn, Maiden's Blush, Jonathan, Fameuse, Rambo, Dominie, Holland Pippin; winter, Winesap, Ben Davis, Missouri Pippin, Willow Twig, York Imperial, Rawle's Genet. Cherry, Early Richmond, English Morello; pear, Bartlett, (Beurre de) Anjou, Clapp's Favorite; plum, Damson, Wild Goose, Miner, Chickasaw.

About fifty per cent. of the apple crop in 1886 was marketable, and the following prices were paid per bushel: Apples 30c., cherries \$1.50, pears \$2, plums, \$2.

All classes of orchard fruits can be grown profitably for market and family uses, excepting the peach, in this county.

Diseases: Blight of the apple and pear were the only diseases known.

Insects: Codlin moth, borers and fall web-worm were prevalent, but not so numerous as in years previous.

Vineyards: About 50 per cent. of the crop in 1886 matured. For market, Concord, Delaware, Catawba, Lady, Elvira and Pocklington were successful, and sold at 2½c. per pound on an average.

Rot of the fruit was not extensive, and produced no material loss to the crop.

Small Fruits: The condition of all classes was good on March 1st, 1886, excepting the raspberry, but rather poor on November 1st following. The average price paid per crate of 24 quarts each in the market: Blackberry \$2.20, currant \$2.50, gooseberry \$2, raspberry \$2.40, strawberry \$1.85.

List of most successful varieties grown in the county: Blackberry, Snyder; currant, Red Dutch, Cherry, Versailles, White Dutch; gooseberry, Houghton, Downing; raspberry, McCormick, Miami; strawberry, early, Crescent, Sharpless; medium, Chas. Downing, Cumberland; late, Capt. Jack, Glendale.

Russian Fruits: Trees on March 1st and November 1st, 1886, were in fair condition; apricots were in same condition.

Farmers are generally planting fruits for family uses.

LYON COUNTY.—By JAMES SIMPSON, EMPORIA.

Orchards: On March 1st and November 1st, 1886, trees of all classes were in a good condition, excepting the pear, and the wood growth for the current year was medium to good.

The failures since 1884 were very light; of the spring planting they were medium, owing to the dry weather.

Location: Second bottom for apple; bottom next to the timber for cherry; up-land and level, to prevent late frosts, for the peach.

The following is a list of varieties which are successful in this county: Apple—Summer, Early Harvest, Hightop Sweet, Red Astrachan, Cooper's Early; autumn, Maiden's Blush, Rome Beauty, Swaar, Fameuse; winter, Ben Davis, Jonathan, Wine-sap, McAfee, Smith's Cider, Rawle's Genet, Lawver. Cherry, Early Richmond; plum, Wild Goose, Emigrant.

About 70 per cent. of the apple crop of 1886 was marketable; and the average market price paid was 20c. per bushel; cherries sold for \$4 per bushel. Pear trees have all been killed by the blight.

The codlin moth has been injurious to the apple, and the curculio has been destructive to the plum. Both insects are increasing in number.

Vineyards: About 65 per cent. of the grape crop of 1886 matured, but was of poor quality. The following is a list of varieties which are successful: Concord, Worden, Champion, Dracut Amber, Martha, Rodgers's No. 12. The Concord is the best variety for market and family purposes. The average market price paid was 5c. per pound. Vineyards do the best on a good bottom and rich land, with good cultivation. The following list is the most successful: Dracut Amber, Ives, Worden, Concord, Champion, Clinton. In 1885 70 per cent. of the grape crop was destroyed by rot, and in 1886 10 per cent.

Small Fruits: On March 1st, 1886, plantations of all classes were in a good condition, excepting the raspberry and strawberry, which were medium. On November 1st, 1886, all plantations were in a poor condition on account of the dry weather. The average market price paid per crate of twenty-four boxes each was as follows: Blackberry \$4.80, currants \$2.40, gooseberry \$2, raspberry \$3, strawberry \$3.50.

The acreage is slowly increasing in planted fruits in this county.

LINN COUNTY.—By F. B. FULKERSON, BARNARD.

(North half.)

Orchards: On March 1st and November 1st, 1886, trees of all classes were in good condition, excepting the peach, which failed. The wood growth of the current year was strong of all classes. The following varieties are the most successful: Apple—Winter, Ben Davis, Willow Twig, Missouri Pippin, Mammoth Pippin, Newtown Pippin, Bellflower. About 50 per cent. of the apple crop of 1886 was marketable; the market price paid per bushel was 25c.

Vineyards: The Concord is the most successful variety, and best for family and market use.

Small Fruits: On March 1st and November 1st, 1886, plantations were in good condition. Bottom lands produce the best results. The most successful varieties in the county are as follows: Blackberry, early, Wilson; medium, Lawton; raspberry, Hansell.

Farmers are generally planting fruits for their home use.

(South half.—By J. W. Latimer, Pleasanton.)

Orchards: On March 1st and November 1st, 1886, trees of all classes were in a good condition, excepting the peach, and the current year's wood growth was medium to strong.

The failures since 1884 were very light, also were those of the spring planting.

All classes of trees produce equally well on a northerly exposure having a red limestone soil.

The following is a list of varieties which are successful in this county: Apple—Summer, Carolina June, Early Harvest, Kirkbridge White, Early Pennock; autumn, Maiden's Blush, Fameuse, Wine (syn. Pa. Redstreak), Lowell; winter, Ben Davis, Willow Twig, Smith's Cider, Winesap, Rawle's Genet, Jonathan. Cherry, Early Richmond; peach, summer, Amsden, Early Red Rarripe; autumn, Old Mixon Free, Lemon Cling, Smock, Stump the World; pear, summer, Howell, Summer Doyenne, Tyson; autumn, Bartlett, Sheldon, Angouleme, Clapp's Favorite; winter, Vicar; plum, Wild Goose.

About 50 per cent. of the apple crop of 1886 was marketable. The average market price paid per bushel was as follows: Apple 25c., cherry \$1.50, pear and plum \$2.

Apple, cherry and pear orchards are very profitable.

Insects: Apple trees have been infested by the root louse, canker worm, tent caterpillar, and the fruit by the codlin moth; cherry has been troubled with the tent caterpillar; pear has been attacked by the codlin moth, and plum by the curculio. None of these insects are as numerous as usual.

Vineyards: About 50 per cent. of the grape crop matured this season, but was not good in quality. The following varieties are the most successful: Concord, Catawba, Agawam, Martha, Dracut Amber. The Concord is the best family and market variety. Average market price paid per pound was 8c. The Concord and Catawba are preferred to others. One-half of the crop of fruit was destroyed by rot.

Small Fruits: On March 1st, 1886, plantations were in a splendid condition. On November 1st, 1886, the blackberry, gooseberry and strawberry were in a good condition; others were injured by drouth. The average market price paid during the season per crate of twenty-four boxes each was as follows: Blackberry \$1.50, raspberry \$2, strawberry \$1.75. The following is a list of the most successful varieties in this county: Blackberry, early, Early Harvest; medium, Kittatinny and Snyder; currant, Red Dutch, White Dutch; gooseberry, Houghton; raspberry, early, Turner, Cuthbert; medium, McCormick; late, Gregg; strawberry, medium, Crescent; late, Kentucky.

The acreage of fruit-planting is decreasing in this county. The general confidence of our people has lessened in the work of horticulture. Farmers are planting fruits for their home uses.

MARION COUNTY.—By J. B. DOBES, ANTELOPE, AND EUGENE F. BARNES, MARION.

Orchards: All classes of fruit trees were in good condition on March 1st and November 1st, 1886, excepting the peach, which was poor. The current year's growth was also good.

Losses of trees since 1884 from the effects of the extremely cold winters intervening have been very light, excepting of the peach. Of the current year's planting, a very small per cent. have failed from drouth.

The following is a list of varieties which are successful in the county in fruit and tree: Apple—Summer, Early Harvest, Carolina June, Red Astrachan, Cooper's Early, Hightop Sweet; autumn, Maiden's Blush, Rambo, Fall Wine, Northern Spy; winter, Missouri Pippin, Ben Davis, Winesap, Grimes's Golden, Rome Beauty. Cherry, Early Richmond, English Morello; pear, Early Harvest, Bartlett, Lawrence; plum, Wild Goose.

About 90 per cent. of the current year's crop of apples was marketable, and sold in the market at an average price of \$1 per bushel. Market price of other fruits: Cherry \$2.50 to \$3 per bushel, pear \$3, plum \$1.85.

All classes of orchards have been profitable investments to their owners.

Diseases and insects have not been seriously damaging to our orchards.

Vineyards: The current year's crop was heavy and of best quality. The Concord and Delaware are best market as well as family varieties, and sold in the market at an average of 4½c. per pound. Vineyards should be protected by shelters. They succeeded on most any soil. Rot was not prevalent the present year, nor was any mildew of the leaf discovered.

Small Fruits: The condition of plantations of all classes on March 1st and November 1st, 1886, was fair to excellent. Location and soil: The currant is most successful on rich, dark soil, where well protected from northern winds; gooseberry a light soil, on a slope well protected; strawberry on a northern or western slope, well protected.

Russian Fruits: Apple and apricot trees were in good condition on November 1, 1886. None have fruited, nor do I believe this class worthy of attention. The acreage of fruit plantations is annually increasing, and farmers are extensively planting for family uses.

(West half.—By William H. Mears, Peabody.)

Orchards: The condition of all classes except the peach was good on March 1st and November 1st, 1886. Their wood growth was only medium.

The losses of trees since 1884 from the effects of the intervening cold winters was quite light, and the same may be reported of the current year's planting.

Location and soil: A northern slope, or a western one, sheltered on the west with wind-breaks, having a limestone soil, is preferred for the apple; cherry should have high, rolling ground, black soil and clay subsoil well drained; peach has done well on all characters of locations, pear on limestone soil well drained.

List of varieties most successful in tree and fruit in the county: Apple—Summer, Carolina June, Red Astrachan, Early Harvest; autumn, Maiden's Blush, Rambo, Cadwallader, Lowell; winter, Ben Davis, Missouri Pippin, Jonathan, Winesap, Rawle's Genet, Willow Twig, Dominie, Grimes's Golden, Gilpin. Cherry, Early Richmond, May Duke, Governor Wood; peach, Amsden, Alexander, Late Crawford, Old Mixon Cling; pear, Angouleme, Bartlett, Kieffer, Seckel; plum, native seedlings, Sand.

About seventy-five per cent. of the current year's apple crop was marketable, and sold on an average of 90c. per bushel. Other fruits sold as follows: cherry \$4 per bushel, pear \$2, plum \$2. All classes of orchard fruits are profitable investments, excepting the peach.

Insects: The codlin moth or apple worm were not very numerous, but the plum curculio did great damage, and the fall web-worm were more numerous than usual.

Vineyards: The current year's product was a full crop. Successful varieties: black, Concord, Ives, Elvira, Hartford; red, Catawba, Delaware; white, Martha, Lady. The Concord and Catawba are the best varieties for market, and with the Ives for family uses. These sold in the market at 5c. per pound. Grape-vines do well on limestone soil when well cultivated and manured. Rot has not reached this section of the country, so far as known.

Small Fruits: The condition of plantations on March 1st and November 1st, 1886, was good, though the strawberry was not as strong as usual, on account of drouth. These fruits generally succeed on most any kind of soil if properly cared for.

Current year's market prices per crate of 24 quarts each: Blackberry \$2.40, gooseberry \$1, raspberry \$2.40, strawberry \$4. **List of most successful varieties:** Blackberry, Kittatinny, Missouri Mammoth, Snyder; currant, Red Dutch, White

Grape; gooseberry, Downing; raspberry, Doolittle; strawberry, Crescent, Chas. Downing, Capt. Jack, Wilson.

Russian Apricot: The trees were in good condition on March 1st and November 1st, 1886. The oldest trees are now ten years old from seed, and bloomed the present year, but this was destroyed by late frosts.

The acreage of fruit-planting is annually increasing, and the confidence of the people strengthened in the ultimate success of fruit culture in the county.

MCPHERSON COUNTY.—By THEO. BOGGS, MCPHERSON, AND GEORGE OLIVANT, CONWAY.

Orchards: All classes of fruit trees were in good condition on March 1st and November 1st, 1886, excepting the peach, which was only medium. The current year's wood growth was generally light to medium.

The failure of trees since 1884 from the effects of the extreme cold winters intervening was light, excepting of the peach, which was heavy. Of the current year's planting the failures were not serious.

Apple and cherry trees are most successful on black, sandy loam, having a porous subsoil; peach and pear on a northern slope, and protected from hard winds; the soil for pears should be a heavy loam; plums in a range for poultry or hogs.

List of varieties successful in tree and fruit: Apple—Summer, Hightop Sweet, Early Harvest, Carolina June, Red Astrachan, Summer Queen; autumn, Maiden's Blush, Lowell, Jonathan, Rambo, Fall Winesap, Rome Beauty, Grimes's Golden, Milam; winter, Ben Davis, Rawle's Genet, Winesap, Roman Stem, Missouri Pippin, American Golden Russet, Willow Twig, Yellow Bellflower, Jonathan, Red Winter Pearmain, McAfee. Cherry, Early Richmond, May Duke, Morello; peach, Hale's, Crawford's Early, Amsden, Alexander, Early York, Yellow Rareripec, Old Mixon Cling, Stump the World; pear, Early Harvest, Summer Doyenne, Osband's Summer, Bartlett, Flemish Beauty, Howell, Louise Bonne de Jersey, Kieffer, Clapp's Favorite, Lawrence, Angouleme, Winter Nelis, Vicar; plum, Wild Goose, Miner, Lombard, German Prune, Weaver.

About 85 per cent. of the apple crop in 1886 was marketable, and sold readily at 90c. to \$1 per bushel. Other orchard fruits sold at the following prices per bushel: Cherry \$4, pear \$6, plum \$2. All classes of orchards are profitable, whenever properly cared for, excepting the peach.

Diseases: None are prevalent; occasionally blight has appeared in a light form.

Insects: Codlin moth, fall web-worm, borers and plum curculio are not numerous. The tree cricket has become prevalent.

Vineyards: About 90 per cent. of a full crop matured and was marketable. The following varieties were successful: Black, Concord, Clinton, Moore's [Early]; red, the Delaware, Dracut Amber; white, the Martha leads. The Delaware and Concord have become favorites for family and market uses, and sold readily in the market at from 5 to 10c. per pound. Vineyards thrive best on sandy, elevated lands and under good cultivation or a mulch. No diseases have as yet appeared.

Small Fruits: Plantations of all classes were in good condition on March 1st and November 1st, 1886. Soils and locations: Blackberry should have a sandy loam and a northern exposure; currant and gooseberry, a black sandy loam with partial shade; raspberry and strawberry, loamy soil on sloping ground. Average market price paid per crate of twenty-four boxes for current crop was: Blackberry \$4.25, gooseberry, \$3, raspberry \$4.50, strawberry \$4.50. Estimated yield per acre of current year's crop: Blackberry 1,200 quarts, gooseberry 1,200, raspberry 1,000, strawberry 2,000. List of most successful varieties: Blackberry, early, Early Harvest, Snyder; medium, Kittatinny; late, Lawton; currant, Red Dutch, Fay's Prolific,

Cherry, White Dutch; gooseberry, Houghton, Downing, Smith; raspberry, early, Doolittle, Turner; medium, Miami, Gregg; late, McCormick; strawberry, early, Wilson, Crescent; medium, Capt. Jack, Charles Downing; late, Kentucky, Glendale, Cumberland, Mt. Vernon.

Russian Fruits: Apple trees were in a fair condition on March 1st and November 1st, 1886. A few varieties fruited, but the fruit was inferior. The trees are not quite as hardy as most of our common sorts. They suffer from our summer's hot winds more than the cold of winter. Apricot trees were in a fair to good condition on March 1st and November 1st, 1886. The oldest-planted trees are now eight to nine years old. Some bloomed the present year, but bore no fruit.

The acreage of fruit-planting is annually increasing, as also the confidence of the people is growing stronger in the future success of horticulture in the county, and farmers are generally planting fruits for family use.

MIAMI COUNTY.—By L. BISHOP, OSAWATOMIE.

Orchards: The condition of all classes of fruit trees was good on March 1st and November 1st, 1886, excepting the peach; and the current year's wood growth was light of the apple, medium of the cherry and peach, good of the pear and plum.

About 20 per cent. of the apple, and all of the peach trees which were in good condition up to the winter of 1884, have since failed from the extreme cold of succeeding winters. No failures occurred in other classes. Of the current year's planting, the failures were very light among home-grown trees, while of those shipped in the loss was very heavy.

Experience of past years has shown that all classes thrive best when planted on high, dry lands.

List of varieties which have been successful in tree and fruit in the county: Apple—Summer, Early Margaret, Carolina June, Red Astrachan, and Mother; autumn, Maiden's Blush, Lowell, Jonathan, Grimes's Golden; winter, Ben Davis, Missouri Pippin, Stark, Willow Twig, Rawle's Genet, Winesap, May, Moore's Sweet. Cherry, Early Richmond, English Morello; pear, Amire Joannet, Clapp's Favorite, Summer Doyenne, Bartlett, Flemish Beauty, Angouleme, Winter Nelis; plum, Wild Goose Damson.

Very little of the apple crop of 1886 was up to standard grade of market fruit; in some orchards not more than 20 per cent., while in others it would reach 80 per cent. Average market price paid in 1886: Apples per bushel, 30c., cherry \$1.50, pear \$2, plum \$1.25.

All classes of orchards are profitable in a run of several years, excepting the peach.

Diseases: None appeared in the orchards during 1886.

Insects: The codlin moth, fall web-worm and handmaid moth troubled the apple, but none were more numerous than in preceding years, excepting the fall web-worm.

Vineyards: Varieties successful—Black, Concord; red, Dracut Amber, Delaware; white, Niagara and Ann Arbor are leading. The Concord, as a family and market variety, has preference to all others. The fruit averaged during the current season in the market 3c. per pound. The vine thrives best when planted on a high, dry soil, trained on trellis, and summer-pruned. Some vineyards have been benefited by mulching the land between the rows. The rot has been prevalent for several years, and at times quite ruinous to a large portion of the crop. Mildew has not been noticed.

Small Fruits: Plantations were generally in good condition on March 1st and November 1st, 1886, excepting the strawberry, which was weakened by the present sea-

son's drouth. These fruits appear to do as well on high, dry and sandy land or prairie loam as elsewhere. Average market price per crate of twenty-four quarts each for the current year: Blackberry \$2.40, gooseberry \$1.75, raspberry \$2.50, strawberry \$2.50. List of varieties most successfully grown in the county: Blackberry, early, Brunton; medium, Snyder; late, Kittatinny; currant, Red Dutch, White Dutch; gooseberry, Houghton, Downing; raspberry, early, Tyler, Souhegan; medium, McCormick; late, Gregg; strawberry, early, Crescent; medium, Chas. Downing; late, Jersey Queen, Jumbo, Glendale.

Russian Fruits: Apple—There are but few young trees on trial which are in good condition. None have fruited yet. Apricot—These trees are about as promising as reported for the apple.

The acreage of fruit planting is annually increasing, and the confidence of the people has not been weakened, only regarding peach culture.

MORRIS COUNTY.—By F. B. HARRIS, WHITE CITY, AND C. KEAR, COUNCIL GROVE.

Orchards: The condition of fruit trees of all classes was good on March 1st, 1886, excepting the peach. In the northern portion of the county, the condition of the apple, cherry, pear and plum is reported as poor on November 1st, 1886; peach good. In the central and southern portion each class is reported in good condition.

Failures since 1884, from the effects of subsequent hard winters, have been light, and were caused more from intense heat and drouth than cold. Failures of the current year's planting were light, and occasioned by drouth largely.

Location and Soil: The apple, peach, pear and cherry thrive best on a northern slope, high land of good quality, and a gravelly subsoil. Some peach orchards succeed on a southern slope; plums on deep upland loam.

List of varieties which are successfully grown in the county: Apple—Summer, Early Harvest, Red Astrachan, Carolina June; autumn, Maiden's Blush, Cooper's Early, Wealthy, Redstreak, Jonathan, Fall Pippin, Chenango (syn. Sherwood's Favorite); winter, Ben Davis, Missouri Pippin, Rawle's Genet, Winesap, Minkler, Smith's Cider, Willow Twig. Cherry, Early Richmond, common Morello; peach, Alexander, Amsden, Hale's, Stump the World, Heath Cling, Crawford's Late; pear, Clapp's Favorite, Osband's Summer, Summer Doyenne, Bartlett, Flemish Beauty, Angouleme, Louise Bonne de Jersey, Onondaga, Vicar, Lawrence, Kieffer; plum, Wild Goose, Washington.

About 65 per cent. of the apple crop of 1886 was marketable, which sold readily at an average of 85c. per bushel. Other fruits sold at an average price as follows: Cherry per bushel \$3.25, pear \$2.50, plum \$2.25.

Apple, cherry, pear and plum orchards have been profitable in the central and southern portion, while only the apple and cherry are reported as profitable in the northern portion.

Diseases: Twig blight on the apple and pear has been prevalent in a light form.

Insects: Borers handmaid moth, tree cricket and plum curculio have been damaging the current season, but not more so than in preceding years, excepting the flat-headed borer, which are prevalent in dry seasons, and the fall web-worm.

Vineyards: About 90 per cent. of the crop matured, which was of good quality, and sold in the market at 4c. per pound. The Concord still maintains its place at the head of the list as the best variety for family and market purposes. Location and soil: The vine thrives best on good upland, having a gentle slope. The ground should be annually manured, well cultivated, and kept mulched in midsummer and fall. Rot has not been prevalent the present year, and no mildew has been discovered.

Small Fruits: In the northern portion of the county, blackberry and raspberry canes were reported injured on March 1st, 1886. Other classes in good condition, while in the central and southern all classes were in fair to good condition. On November 1st, 1886, blackberry, raspberry and strawberry plants were reported in poor condition; currant good, and gooseberry medium. In the northern portion, condition of the blackberry, gooseberry and raspberry was reported on November 1st, 1886, as good; currant and strawberry injured by the drouth. The average current price per crate of 24 quarts paid: Blackberry \$3.50, gooseberry \$2, raspberry \$3.30, strawberry \$2.50. List of successful varieties: Blackberry, early, Early Harvest; medium, Kittatinny, Lawton; late, Snyder; currant, Red Dutch, White Grape; gooseberry, Houghton, Downing; raspberry, early, Souhegan, Doolittle; medium, Turner, McCormick, Ironclad; late, Gregg, Shaffer; strawberry, early, Wilson, Crescent; medium, Jas. Vick, Manchester, Sharpless; late, Sharpless, Wilson.

Russian Fruits: The condition of apple trees was good on March 1st and November 1st, 1886, but they are no more hardy than the common sorts grown in this county. Apricot trees were in good condition on March 1st and November 1st, 1886. Their fruit buds were killed during the preceding winter.

The acreage of fruit-planting is annually increasing, and the people have confidence in the future of the fruit-growing pursuit.

OSAGE COUNTY.—By J. G. CLARK, WAVELAND.

(North half.)

Orchards: On March 1st, 1886, apple, peach and plum trees were in good condition; other classes were medium to poor. On November 1st following, all classes were good, excepting the cherry. The current year's wood growth was medium to light, owing to a drouth.

Failures of trees since 1884 from the effects of the cold winters intervening were quite light, also light of the current year's planting.

Location and Soil: For the apple, very little difference is found in our varying soils. Good care and cultivation are the main requirement. The same may be said of the cherry. The peach has done the best on highlands having a light soil; pear succeeds on any soil which does not produce too strong a growth; plum should have a northern location, to prevent early blooming, which is generally killed by late spring frosts.

List of varieties successfully grown in this county: Apple—Summer, Early Harvest, Carolina June, Hightop Sweet, Maiden's Blush; autumn, Rambo, Westfield Seek-no-further, Wagener; winter, Rawle's Genet, Baldwin, Winesap, Roxbury Russet, Hubbardston. Peach, Amsden, Harrison; pear, Sugar, Buffum, Bartlett, Angouleme, Sheldon, Vicar, Easter Beurre.

About 50 per cent. of the apple crop of the present year was marketable, which sold at an average of 50c. per bushel. Average current prices of other fruits sold in the market: Cherry \$2.50 per bushel, pear \$2.50, plum \$5.

Apple and pear orchards are profitable for market. Other classes are only for family purposes.

Diseases: Blight on the apple, cherry and pear trees.

Insects: Codlin moth, canker worm and curculio have been the most damaging. The last named and the tree cricket were more numerous the present year than usual, while all others were less.

Vineyards: The crop in 1886 was a full one, and can be marked 100. List of varieties successfully grown in this county: Black kinds, Concord, Ives, Champion; red, Delaware. The Concord still holds the lead for a best market sort, and the

Delaware as best for family uses. These sold readily at an average of 4c. per pound. The vines succeed planted in any well-drained land, well cultivated, trained to trellis. Rot has not been prevalent in this county, and very little of mildew.

Small Fruits: On March 1st, 1886, blackberry plants were slightly injured. All other classes were in good condition. All passed the season in good condition, except such as were not well cultivated. These fruits succeed on any good corn land. The average market price paid for small fruits in 1886 was: Blackberry \$1.50 per crate of 24 quarts, currant \$2.40, gooseberry \$2.40, raspberry \$3, strawberry \$2.

Russian Apricot: The trees passed the last cold winters uninjured, and bloomed the past spring, but the fruit was destroyed by a late spring frost.

The acreage of fruit planting is annually increasing, and the people have full confidence in successful results.

PAWNEE COUNTY.—By J. F. HURSH, GARFIELD.

Orchards: Condition of trees on March 1st and November 1st, 1886: Apple, good; cherry, fair; peach, poor; pear and plum, good. The current year's growth was medium.

Failures of fruit trees since 1884 were heavy, caused mainly by neglect; of the spring planting not heavy, from same cause.

Bottom land, having a northern slope, has proven to be the best for orchards.

Insects have not been prevalent during the present year.

Vineyards: The Concord is the leading variety of grape in the county for all purposes. The vines are most successful when planted on an eastern slope, having a dark, loamy soil, and clay subsoil. The canes should be laid down in the fall, and covered; pruned in early spring, and managed on the renewal system.

Small Fruits: Condition on March 1st and November 1st, 1886, of gooseberry and strawberry plants good, raspberry fair. These do the best on highly-enriched loamy soil, having northern exposure.

The acreage of fruit-planting is annually increasing, and the people have confidence of future success.

RENO COUNTY.—By J. J. MEASER, HUTCHINSON.

Orchards: The condition of all classes of fruit trees was good on March 1st, 1886, and November 1st following, excepting the peach. The current year's wood growth was medium. No failures occurred in the spring planting, excepting where damaged trees were used.

Orchards succeed in the Arkansas valley on any good corn land.

List of varieties successfully grown in the county: Apple—Summer, Carolina June, Early Pennock, American Summer; autumn, Grimes's Blush, Maiden's Blush. Jonathan; winter, Missouri Pippin, Ben Davis, Winesap, Wagener, Willow Twig, Cherry, Early Richmond, English Morello; pear, Osband's Summer, White Doyenne, Bartlett, Louise Bonne de Jersey; plum, Wild Goose, Miner. About 75 per cent. of the apple crop in 1886 was marketable.

All classes of orchards are profitable investments, except the peach.

No diseases have appeared, and but few insects injurious to fruit trees.

Vineyards: The Concord still holds the head of the list for family and market purposes, although many new varieties are being tested by D. M. Wright of this place, and give great promise of being valuable. [NOTE.—The *finest exhibit* I have seen in the State was sent me by Mr. Wright, and embraced largely varieties of recent introduction. The size and fullness of the bunches and berry, and exceedingly rich quality, speak strongly in favor of the adaptation of the Arkansas valley to grape culture.—Szo'r.]

Small Fruits: The condition of plantations on March 1st and November 1st, 1886, was fair to good of all classes.

Russian Apricot: The trees passed the cold winters of 1884-86 uninjured, and bloomed in the spring of the present year, but failed in fruiting, owing to a snow storm during the blossoming period. This was the first failure for several years.

The acreage of fruit-planting is annually increasing, and our people have great confidence in the success of horticulture in this valley.

(By J. E. White, Kent.)

Orchards: The condition of fruit trees of all classes was good on March 1st and November 1st, 1886, except the cherry, which was only fair. The current year's wood growth was light of all classes, except the apple, which was medium.

Failures in the current year's planting were heavy, and owing to poor condition of the stock used.

Location and Soil: Apple trees thrive best on a dry or well-drained deep, black loam; cherry, dry, and inclined to clay soil; peach, light sandy soil; pear and plum, heavy, black sandy land, with a clay subsoil.

List of successful varieties: Apple, Carolina June, Red Astrachan, Early Pennock, Summer Queen; autumn, Maiden's Blush, Fall Pippin, Jonathan, Milam; winter, Missouri Pippin, Rome Beauty, Winesap, Grimes's Golden, Ben Davis, Rhode Island Greening, Willow Twig, Smith's Cider, Roman Stem, Smokehouse. Cherry, English Morello; plum, Wild Goose, Miner, Washington.

About 80 per cent. of the current year's apple crop was marketable, and sold readily at \$1 per bushel. Average current prices for other fruits: Cherry \$4.80 per bushel, pear \$5, plum \$1.50.

All classes of orchards are a profitable investment, where properly managed, excepting the peach.

Diseases: None noticed, excepting a light form of twig blight on apple trees.

Insects: These have not been numerous or materially damaging as yet, excepting the flat-headed borer, which is most troublesome in dry seasons.

Vineyards: About ninety per cent. of a full crop of grapes was matured, which was excellent in quality. List of varieties which are grown successfully: Black, Concord, Victor, Moore's [Early], Worden, Wilder, Highland; red, Jefferson, Delaware, Dracont Amber, Catawba; white, Lady, Lady Washington, Duchess, Perkins, Niagara. The fruit sold in the market at 5c. per pound. Grape-vines thrive well on all our different soils, and fruit abundantly every year. I believe they will do best on the black, sandy bottom lands, and produce heaviest crops. Rot has not been prevalent, nor the mildew of the leaf.

Small Fruits: All classes were in good condition on March 1st and November 1st, 1886. These thrive on the black bottom land.

Russian Apricot: The trees are hardy and promising.

The acreage of fruit planting is annually increasing, and there is a general confidence in the success of such investments.

RICE COUNTY.—By J. B. SCHLICHTER, STERLING.

Orchards: On March 1st, 1886, and November 1st following, trees of all classes were in good condition, excepting the peach, which was injured. The current year's wood growth was light of the cherry and peach; of other classes, medium.

Since 1884, 10 per cent. of the cherry and 50 per cent. of the peach have failed, caused by severe winters. Of the spring planting, 50 per cent. of all classes of trees failed on account of inferior shipped-in stock, and drouth.

Location and Soil: The apple and cherry have succeeded best during the past years on a sandy loam with a heavy subsoil, and where the water is from 5 to 12 feet from the surface; peach, pear and plum on a sandy loam with a clay soil.

The most successful varieties in this county in tree and fruit are as follows: Apple—Summer, Early Harvest; autumn, Maiden's Blush, Rambo; winter, Missouri Pippin, Ben Davis, Winesap, Jonathan, Rawle's Genet. Cherry, Early Richmond, common Morello; peach, Amsden; pear, Bartlett, Seckel; plum, Sand (Hill), Wild Goose, Emigrant.

About 50 per cent. of the apple crop of 1886 was marketable. The average market price paid per bushel this season was: Apples \$1, cherries \$3.50, pears \$4, plums \$2. Considering the cost of trees, land and labor, orchards of all classes, excepting the peach, are profitable.

The spring planting of 1886 of the apple was in excess of the preceding years; of others it was not.

Insects: The curculio attacked the apple, cherry and plum this season. The plum has been attacked by the plum gouger.

Vineyards: A full crop matured, but the quality was not as good as in previous years. The Concord is the main variety grown in this county, and the fruit sold at 4c. per pound this season. Vineyards do best on a sandy loam, with close pruning. The following varieties are preferred: Early, Champion, Moore's [Early]; medium, Concord; late, Elvira, Goethe.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in good condition, excepting the strawberry, which was poor. Location and soil: Blackberry, gooseberry and raspberry do best on a north or eastern slope having a clay or sandy loam; currants succeed wherever properly shaded. The average price paid per crate of twenty-four boxes this season for the fruit was: Blackberry, raspberry and strawberry \$4.80. The most successful varieties in this county are: Blackberry, early, Early Harvest; medium and late, Kittatinny; gooseberry, Houghton; raspberry, early, Souhegan, Turner; medium, McCormick, Hopkins, Cuthbert; late, Gregg; strawberry, early, Crescent, Charles Downing; medium, Charles Downing, Capt. Jack; late, Glendale.

The oldest-planted trees in this county were set 14 years ago. The acreage of fruit-planting is annually increasing, and the general confidence of our people in horticulture has increased. Farmers are planting fruits quite extensively for home uses.

RUSH COUNTY.—By W. M. GOODWIN, LA CROSSE, AND C. P. HART, RUSH CENTER.

Orchards: All classes of fruit trees were in good condition on March 1st and November 1st, 1886, excepting the peach and cherry, some few trees of which were injured by the cold of the preceding winter. Wood growth of the current year: Apple and cherry, good; peach, strong; pear and plum, strong.

Failures in orchards since 1884 have been light. Of the spring planting, apple 20 per cent., cherry 90 per cent., peach 10 per cent. These losses are clearly traceable to a bad condition of the trees before planting, being the deliveries of tree-peddlers.

All classes of orchards thrive best on uplands, having a northern slope.

Fruit-growing promises to be profitable in the county; no diseases have been noticed as affecting the tree, nor are any species of insects prevalent.

Grapes so far as tried have been successful in vine.

All classes of small fruits were in good condition at the close of the present season, and promised a crop of fruit in 1887.

The acreage of fruit-planting is annually increasing, and the people are very confident of successful results.

STAFFORD COUNTY.—By C. G. McNEIL, STAFFORD, AND NELSON NICKERSON, SANDAGO.

Orchards: The condition of all classes on March 1st, 1886, was good, excepting the peach which was poor. On November 1st following all classes were good, the peach recovering. The season's wood growth was fair to strong.

The losses of trees since 1884 have been light of all classes, excepting the peach, which has been heavy; of the spring planting light, owing mainly to bad handling before planting, and neglect afterwards.

Most classes thrive best on a sandy soil, and northerly slope.

Orchards promise to be profitable in this county, and the evidence so far is encouraging, as trees well cared for are making a good growth.

Vineyards: The Concord is the most successful and productive variety. A northern exposure, having a sandy soil, is preferred. The fruit has not suffered from any disease.

Small Fruits: Plantations, on March 1st, 1886, and November 1st following, were in good condition. Blackberries thrive best on sandy land and sheltered; all the others on a black, sandy loam.

The acreage of fruit-growing is increasing annually, and the confidence of the people in future success is strong. Farmers are generally planting for home purposes.

WABAUNSEE COUNTY.—By ABNER ALLEN, WABAUNSEE.

Orchards: Trees were in a good condition on March 1st and November 1st, 1886, and the current year's wood growth was medium.

Failures since 1884 were very light; also of the spring planting of 1886.

Orchards on rich or heavy soils have produced the best results the past years.

The following is a list of varieties which are successful in the county: Apple—Summer, Early Harvest, Carolina June, Chenango; autumn, Maiden's Blush, Lowell, Jonathan, Wine; winter, Ben Davis, Missouri Pippin, Rawle's Genet, Willow Twig, Gilpin. Cherry, Early Richmond, English Morello; peach, early, Amsden; autumn, Yellow Rareripec, Red Rareripec, Smock; pear, summer, Doyenne, Dearborn; autumn, Seckel, Anjou, Angouleme; winter, Lawrence, Winter Nelis; plum, Deep Creek, Wild Goose, Murray.

About 60 per cent. of the current year's apple crop was marketable. The following are the average market prices paid per bushel for fruits: Apple 75c., cherry \$2, pear \$2.50, plum \$1. Apple, cherry and pear orchards are very profitable; peach and plum are not.

Insects: The codlin moth has been injurious to the apple, and the curculio, the plum. The fall web-worm was more numerous than usual the present year.

Vineyards: Yielded a full crop, which was of excellent quality, in 1886. The following varieties of grapes are successfully grown: Beauty, Brighton, Concord, Worden, Martha, Lady, Pocklington, Elvira. The Worden is the best market variety; the Brighton the best for family uses. The average market price paid per pound for the fruit was 3c. The following varieties are preferred for planting: Worden, Lady, Brighton, Martha, Concord, Elvira, Catawba, and Clinton.

Small Fruits: On March 1st, 1886, plantations were in a good condition, also on November following, excepting the strawberry, which was mostly destroyed by the season's drouth. A high northern slope with a heavy subsoil is preferred for these fruits. The following is an average of prices paid per crate of twenty-four boxes each the present year: Blackberry and raspberry \$2.85, gooseberry \$1.20, currant \$2.40. The most successful varieties grown in the county are: Blackberry, Taylor, Wallace, Western Triumph; currant, Red Dutch, Cherry, Victoria, White Grape,

White Dutch; gooseberry, Pale Red; raspberry, early, Doolittle; medium, McCormick; late, Gregg, Shaffer; strawberry, early, Cumberland, Mt. Vernon.

Russian Fruits: On March 1st and November 1st, 1886, apricot trees were in promising condition.

The oldest orchard trees in this county were planted 30 years ago. The acreage of fruit-planting is annually increasing, and the farmers are planting fruits as fast as they are able for family uses. The general confidence of our people in the work of horticulture is growing stronger each year.

SOUTHERN FRUIT DISTRICT.

ALLEN COUNTY.—By C. C. KELSEY, HUMBOLDT.

Orchards: On March 1st and November 1st, 1886, trees of all classes were in a good condition. The wood growth of 1886 of the apple, cherry and peach was medium; of the pear and plum strong.

Of the apple and pear, 10 per cent. have failed since 1884, of the peach 25 per cent., caused by the severe winters. Of the spring planting, about 5 per cent. of all classes of trees failed.

Location and Soil: The apple does the best on a well-drained black soil; cherry, on a well-drained light soil; pear, high, well-drained, deep, rich soil.

The most successful varieties in this county in tree and fruit, are as follows: Apple—Summer, Early Harvest, Red Astrachan, Carolina June; autumn, Maiden's Blush, Lowell; winter, Ben Davis, Missouri Pippin, Winesap, Rawle's Genet, Smith's Cider. Cherry, Early Richmond; peach, Amsden, Hale's, Old Mixon Free; pear, Summer Doyenne, Madeleine, Early Harvest, Bartlett, Howell, Louise Bonne de Jersey, Vicar, Angouleme; plum, Wild Goose, Damson, Sand.

About 50 per cent. of the apple crop in 1886 was marketable. The average market price paid per bushel for the several classes of fruit was: Apple 50c., cherry \$2, pear and plum \$1.50.

Considering all expenses, all classes of orchards are very profitable excepting the peach.

There were not as many apple trees planted this spring as there were in the spring of 1885, but more of pear.

Twig blight damaged the apple 25 per cent. and pear 10 per cent., this season.

Insects: The codlin moth and round-headed borer have been at work on the apple. The codlin moth also attacked the pear; curculio on the plum. The codlin moth was more numerous than in previous years.

Vineyards: The grape crop in 1886 was No. 1 in quality. The Concord is the only variety grown here. The market price of the grape this season was 2 cents per pound. Rot injured the crop 25 per cent.

Small Fruits: On March 1st and November 1st, 1886, the condition of plantations of all classes was good. The following prices were paid per crate of twenty-four boxes each this season: Blackberry \$2, currant \$3, gooseberry \$1, raspberry \$4, strawberry \$1.75. The following is a list of the most successful varieties in the county: Blackberry, early, Early Harvest; medium, Kittatinny; late, Snyder; currant, Red Dutch, White Dutch; gooseberry, Houghton; strawberry, early, Crystal City; medium, Truitt's Surprise, Crescent, Charles Downing; late, Windsor Chief, Captain Jack.

The acreage of fruit planting is annually increasing, and farmers are planting fruits generally for home uses.

BUTLER COUNTY.—By W. H. LITSON, BENTON.

Orchards: On March 1st and November 1st, 1886, trees of all classes seemed to be in good condition. The wood growth of 1886 of the apple and peach strong, others medium.

The cherry since 1884 has failed 5 per cent., caused by overbearing and breaking down; peach has failed 75 per cent., caused by the extreme cold winters. About 50 per cent. of the spring planting of all classes of trees failed, caused by drouth and planting inferior stock.

The following list are the most successful varieties in this county in tree and fruit: Apple—Summer, Early Harvest, Cooper's Early, Hightop Sweet; autumn, Oldenburg, Maiden's Blush, Fameuse, Rome Beauty, Wine (syn. Pa. Redstreak); winter, Missouri Pippin, Ben Davis, Jonathan, Winesap. Cherry, Early Richmond, common Morello; peach, Hale's, Amsden, Alexander; pear, White Doyenne, Flemish Beauty, Angouleme, Bartlett, Vicar; plum, Miner, Wild Goose.

About 50 per cent. of the apple crop in 1886 was marketable. Average market price paid for the several classes of fruit per bushel in this county: Apple 75c., pear \$2.50, plum \$3.

The spring planting was not as heavy as that of the preceding year.

Insects: The codlin moth is very numerous with the apple this season. The fall web-worm is more numerous than usual.

Vineyards: The grape matured 75 per cent. of a crop this season, and of a very fine quality. The Concord is the most successful variety of black grapes; the Dracut Amber is the most successful red variety. The Concord is the best variety for market and family. The average market price paid per pound in this market this season was 5c.

Small Fruits: On March 1st, 1886, plantations of all classes were in a fine condition, excepting the strawberry, which was badly winter-killed. On November 1st, 1886, plantations of all classes were in a good condition. The following are the average market prices paid per crate of twenty-four boxes each: Blackberry and raspberry \$3, strawberry \$2. The following is a list of the most successful varieties in this county: Blackberry, early, Kittatinny; late, Snyder; currant, Red Dutch; gooseberry, Houghton; raspberry, early, Tyler; medium, Gregg; late, Cuthbert; strawberry, medium, Charles Downing, Crescent.

Farmers are planting fruits for home uses.

CHAUTAUQUA COUNTY.—By D. C. BALDWIN, HART'S MILLS.

Orchards: On March 1st and November 1st, 1886, trees of all classes were in a good condition. The wood growth of 1886 was strong of the peach and plum, apple and pear medium, cherry poor.

The best results in orcharding have been produced on a good, dry bottom land, having northeast slope.

The most successful varieties in this county, in tree and fruit, are as follows: Apple—Summer, Early Harvest, Summer Queen, Red Astrachan; autumn, Maiden's Blush, Wagener; winter, Missouri Pippin, Winesap, Rawle's Genet, Jonathan. Pear, Bartlett; cherry, English Morello, common Morello, May Duke; plum, Miner, Wild Goose, Chickasaw.

About 75 per cent. of the apple crop in 1886 was marketable. The average market price paid per bushel for the several classes of fruit in 1886 was as follows: Apple 70c., cherry \$2.50 to \$3, pear \$1 to \$2.

Considering all cost and labor, orchards of all classes, excepting the peach, are more profitable than any farm crops.

Vineyards: The grape crop was perfect this season in maturity and quality. The most successful varieties in this county are as follows: Black, Concord, Ives; red, Delaware, Dracut Amber. The Concord is the best variety for the market. Location: Vineyards do well on dry bottom lands, with good cultivation, and close pruning in the winter or spring.

Small Fruits: On March 1st, 1886, the currant, gooseberry and strawberry were in a good condition; others were slightly injured by the severe winters. On November 1st following, plantations of all classes were in a good condition.

Russian Fruits: On March 1st and November 1st, 1886, apple trees were in a good condition. On March 1st and November 1st, 1886, apricot trees were in a good condition. The age of the oldest-planted trees in this county is five to seven years.

The past year the acreage of fruit-planting was increasing, but this year it is moving rather slowly. Farmers are planting fruits for home benefits.

CHEROKEE COUNTY.—By THOS. W. SMITH, BAXTER SPRINGS.

Orchards: On March 1st and November 1st, 1886, trees of all classes were in a good condition. The wood growth of 1886 was strong of all classes.

The per cent. of failures since 1884 are as follows: Apple 15 per cent., caused by fires, stock and rabbits; cherry 20 per cent., caused by very wet weather in May, and followed by intense heat in June; pear 35 per cent., blighted. The per cent. of failures during the spring planting was as follows: Apple, peach and pear 25 per cent., caused by drouth; cherry and plum 20 per cent., same cause.

The most successful varieties in this county in tree and fruit are: Apple—Summer, Early Harvest, Early Strawberry, Red Astrachan, Hightop Sweet; autumn, Maiden's Blush, Rome Beauty, Rambo, Fameuse; winter, Willow Twig, Ben Davis, Missouri Pippin, Jonathan, Roman Stem, Lawver. Cherry, Early Richmond; peach, Amsden, Hale's, Large Early York, Beatrice, Old Mixon Free, Heath Cling, Ward's Late Free, Stump the World, Chinese Cling, Smock, Indian Blood Cling; pear, Early Harvest, Madeleine, Bartlett, Clapp's Favorite, Howell, Flemish Beauty, Seckel; plum, Wild Goose, Weaver.

About 20 per cent. of the apple crop in 1886 was salable. The following is the average market price paid per bushel this season: Apple 35c., cherry, peach and plum \$1.50.

Considering all things, all classes of orchards, excepting the pear, are profitable. The pear has been subject to blight this season.

Vineyards: The Concord is the only variety grown to any extent here. Vineyards do very well on a southeast slope, sandy loam, trained on wire trellises not to exceed 8½ feet high; good, thorough cultivation. The following varieties are preferred: Dracut Amber, Concord. The rot injured the crop 75 per cent. this season.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in a good condition. The average market price paid per crate of twenty-four boxes each, is as follows: Blackberry \$1.20, gooseberry 75c., raspberry \$3.60, strawberry \$1.80. The following varieties are the most successful: Blackberry, early, Kittatinny; late, Snyder; gooseberry, Pale Red [syn. American Seedling]; raspberry, medium, Turner.

Russian Fruits: On March 1st and November 1st, apple trees were in a good condition. On March 1st and November 1st, 1886, apricot trees were in a good condition.

The acreage of fruit-planting is annually increasing in this county. The general confidence of our people in the work of horticulture has not weakened during the past two years. Farmers are planting fruits for their home uses.

(North half.—By D. S. Freeman, Columbus.)

Orchards: All classes of fruit trees were in good condition on March 1st and November 1st, 1886, excepting the peach. The current year's wood growth was light of the apple, cherry and peach, and good of the pear and plum.

Failures of trees since 1884 were light of all classes excepting the peach, which was heavy, owing to the extremely cold winters following, old age, and negligence; of the current year's planting, light.

From results of past years, the conclusion has been formed that with the apple, location and soil are not so important as the condition of the land maintained by careful culture, and properly drained; cherry should have high and well-drained land, and well cultivated; peach, rolling ground, well drained; pear would be as successful as the apple under the same treatment if blight could be prevented; plum seems at home in southern Kansas on most all soils and locations.

List of varieties succeeding in tree and fruit in this county: Apple—Summer, Early Harvest, Carolina June, Red Astrachan, Benoni, American Summer; autumn, Maiden's Blush, Rambo, Jonathan, Fallawater, Fall Wine; winter, Ben Davis, Wine-sap, Willow Twig, Rome Beauty, White Winter Pearmain, McAfee, Rawle's Genet, Milam, Yellow Bellflower, Grimes's Golden, Missouri Pippin. Cherry, Early Richmond; peach, Amsden, Governor Garland, Hale's, Golden Acme, Old Mixon Free, Stump the World, Ward's Late Free, Lemon Cling, Large Early York; pear, Bartlett, Osband's Summer, Flemish Beauty, Angouleme, Seckel, Anjou, Vicar, Winter Nelis; plum, Wild Goose, Damson, Blackman.

About 40 per cent. of the current year's apple crop was marketable. The following is an average of prices paid per bushel for fruits in 1886: Apple 40c., cherry \$2, pear \$1.50, plum \$2.50.

Considering the value of land, cost of trees, and other expenses, all classes of fruit orchards are highly profitable in the county, excepting of the peach.

Insects and diseases have not been damaging to our orchards, not even appearing.

Vineyards: About 75 per cent. of the crop of 1886 was marketable. The following varieties are successfully grown in the county: Black, Concord, Ives, Clinton; red, Dracut Amber, Delaware; white, Martha, Lady, Elvira. The Concord, Dracut Amber and Clinton are most valuable for market, and Concord and Delaware for family uses. These are successful on rolling, well-drained land, and when closely pruned.

Small Fruits: On March 1st, 1886, the condition of blackberry and raspberry plantations was only fair; currant, gooseberry and strawberry excellent. On November following, all were in good condition. The blackberry should have rich land; currant the same, with shade and mulch; strawberry, sandy land. The others—gooseberry and raspberry—succeed in any place. The following is an average of the prices paid per crate of twenty-four quarts each in 1886: Blackberry \$2.20, gooseberry \$1.75, raspberry \$2.12½, strawberry \$2. The Kittatinny blackberry, Cherry, Red Dutch, White Grape and White Dutch currant, Houghton and Downing gooseberry, Turner, McCormick and Gregg raspberry, Crystal City, Chas. Downing, Wilson, Kentucky and Crescent strawberry, are successfully grown in the county.

Russian Fruits: The apple trees sold in the county by agents of the Chain and Hill Home nurseries, of Ohio, were clearly frauds and swindles. The trees are not hardy. Apricot trees were in a fair condition on March 1st and November 1st, 1886. A few bloomed this season, but failed to bear fruit, owing to the severe cold of last winter.

The acreage of fruit-planting is slowly increasing each year. Farmers generally are planting for family use, as much as they are able.

COWLEY COUNTY.—BY JACOB NIXON, WINFIELD.

Orchards: On March 1st and November 1st, 1886, trees of all classes were in a good condition. The wood growth of 1886 was strong of the apple and peach, medium of the pear and plum, light of the cherry.

The per cent. of failures since 1884 of all classes was very light. Of the spring planting, 5 per cent. of the apple failed, caused by flat-headed borers.

The most successful varieties in this county in tree and fruit are as follows: Apple—Summer, Cooper's Early, Hightop Sweet, Red Astrachan; autumn, Maiden's Blush, Wine; winter, Missouri Pippin, Winesap, Rome Beauty, Jonathan, Smith's Cider, Ben Davis. Cherry, Early Richmond, Montmorency; peach, Alexander, Rivers, Hale's, Large Early York; pear, Osband's Summer, Bartlett, Flemish Beauty, Louise Bonne de Jersey, Angouleme, Vicar, Seckel; plum, Wild Goose, Weaver, Green Gage.

Of the apple crop of 1886, 25 per cent. was marketable. The average price paid per bushel in this market for fruit was as follows: Apple 75c., cherry \$4, pear \$3.

Orchards of all classes are profitable, considering cost of trees, labor, and land.

The planting the past spring was larger than of the year before.

Insects: The codlin moth was prevalent in the apple this season, and more numerous in number than in previous years. The plum curculio was more destructive to the plum than in former years.

Vineyards: About 50 per cent. of the grape crop matured this season, and was of fine quality. The following varieties are the most successful in this county: Black, Concord, Champion, Moore's, Hartford; red, Catawba, Delaware, Dracont Amber; white, Prentiss, Martha, Lady. The Concord is the best market and family variety. The average market price paid per pound for grapes this season was 4c. Location: Vineyards have done the best in the Arkansas bottom when planted 8x8 feet in rows and trained on trellis; have yielded eight tons per acre. The following varieties are preferred: Moore's, Champion, Concord, Brighton, Delaware, Catawba, Salem. Rot injured the crop 5 per cent. this season.

Small Fruits: On March 1st and November 1st, all plantations were in a good condition, excepting the currant.

Russian Apricot: On March 1st, 1886, trees were in a good condition, but fruit buds were killed by the winter.

The age of the oldest orchard trees in this county is fifteen years.

The acreage of fruit-planting is annually increasing in this county, especially of small fruits. Farmers are planting fruit generally for home purposes.

CRAWFORD COUNTY.—BY L. J. COLTON, GIRARD.

Orchards: On March 1st, 1886, trees of all classes were in a poor condition. On November 1st following, trees of all classes were in good condition. The wood growth of 1886 was light of all classes.

Since 1884 about ten per cent. of the apple has failed. Of the spring planting ten per cent. of all classes failed, caused by usual carelessness.

The following varieties are most successful in tree and fruit: Apple—Summer, Early Harvest, Carolina June, Benoni; autumn, Maiden's Blush, Fameuse, Lowell, Rambo; winter, Den Davis, Winesap, Missouri Pippin, Willow Twig, Rawle's Genet. Cherry, Early Richmond, English Morello; pear, Bartlett, Angouleme, Flemish Beauty, Vicar; plum, Wild Goose, Miner.

Of the apple crop in 1886, ninety per cent. was marketable. The following are the market prices paid per bushel this season: Apple 50c., cherry \$2.50, pear and plum \$2 to \$3.

Considering all cost and trouble, orchards of all classes excepting the peach are very profitable.

The planting in the spring of 1886 was about the same as the spring before. The blight injured the apple tree 10 per cent. and the pear 20 per cent. this year.

Insects: The apple tree was infested with the borer, and the fruit with the codlin moth. The plum was attacked by the curculio.

Vineyards: The grape matured a good average crop. The following varieties are the most successful in this county: Black, Concord; red, Dracut Amber; white, Elvira. The Concord is the best family and market variety. The average market price paid per pound this season was 4c. The following varieties are preferred: Concord, Dracut Amber, Elvira.

Small Fruits: On March 1st and November 1st, plantations of all classes were in a good condition. The blackberry needs good drainage, and the currant both drainage and mulching. The average market price paid per crate of twenty-four boxes each this season was: Blackberry \$2, gooseberry and strawberry \$1.50, raspberry \$3. The estimated yield per acre of the raspberry is 20 bushels, strawberry 40 bushels. The following varieties are the most successful in this county: Blackberry, early, Kittatinny; currant, Red Dutch, White Grape; gooseberry, Houghton; raspberry, early, Turner, Hopkins; medium, McCormick; late, Cuthbert, Gregg; strawberry, early, Crescent; medium, Chas. Downing, Champion; late, Glendale.

Russian Apricot: On March 1st and November 1st, 1886, trees were in a good condition.

The acreage of fruit-planting is annually increasing in this county. The general confidence of our people in the work of horticulture has not lessened during the past and present years. Farmers are generally planting fruits for their home uses.

ELK COUNTY.—By S. D. LEWIS, ELK FALLS.

Orchards: On March and November 1st, 1886, trees of all classes were in a good condition, excepting the peach, of which the old trees were poor. The wood growth of 1886 was strong of the apple, peach, and plum; cherry and pear, medium.

Since 1884, the apple has failed 10 per cent., caused by the borers and sun-scald. Of the peach, 40 per cent. failed, caused by borers and the extreme cold weather. Of the spring planting, 20 per cent. of the apple, 10 per cent. of the plum and 50 per cent. of the peach failed, caused by the continuous drouth during June and July.

Location and Soil: The rich, well-drained bottom land is by far the best location for the apple. The table or prairie lands are the best for the peach and pear; they seem to do equally as well on sandy or lime soil.

The following varieties are the most successful in this county in tree and fruit: Apple—Summer, Early Harvest, Carolina June, Red Astrachan; autumn, Maiden's Blush, Jonathan, Rambo; winter, Ben Davis, Winesap, Missouri Pippin, Willow Twig, Smith's Cider, Rome Beauty, Rawle's Genet. Cherry, Early Richmond, Gov. Wood, peach, Amsden, Alexander, Hale, Large Early York, Louise, Old Mixon Free, Stump the World, Morris White; pear, Bartlett, Louise Bonne de Jersey, Flemish Beauty, Sheldon, Angouleme, Vicar; plum, Wild Goose, Damson, Miner, Weaver.

Of this year's apple crop, 80 per cent. was marketable. The following is the average market price paid per bushel: Apple 50c., cherry \$2, pear and plum \$3.

Considering all things, the apple, peach, pear and plum orchards are very profitable; cherry is not.

Insects: The borers have done the usual amount of damage to the apple and peach trees this season. The plum curculio is more numerous this year than usual.

Vineyards: The grape matured 50 per cent. of a crop, but it was poor in quality.

The following are the most successful varieties of grapes in this county: Black, Concord, Clinton; red, Diana, Delaware; white, Niagara, Prentiss, Elvira, Pocklington. The Concord is the best market and family variety. The average market price paid per pound this season was 5c. Location: As to location and soil, there appears to be but very little difference. Grape-vines do well on a high, low, sand or limestone soil, with shallow cultivation, light mulching, and close pruning in the spring. The following varieties are preferred: Early, Moore's, Hartford; medium, Concord, Elvira, Prentiss; late, Clinton, Dracut Amber. In 1885 the rot destroyed one-half the crop, supposed to be on account of the very wet season.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in a good condition. Location and soil: Blackberry succeeds best on a rich low or bottom soil, with a north protection; gooseberry does the best on bottom land, with a partial shade by trees or building to keep them from blooming early in the spring; raspberry do best on a dry, rich soil, with plenty of lime, on a north slope or partially shaded by trees. The average market price paid per crate of twenty-four boxes each was: Blackberry \$3.60, gooseberry and strawberry \$2.40, raspberry \$3.

Russian Fruits: The apple trees on March 1st and November 1st, 1886, were in a good condition. None but the Red Astrachan fruited. Apricot trees on March 1st and November 1st, 1886, were in a fine condition.

The acreage of fruit-planting is largely increasing in this county, and the confidence of our people in the work of horticulture has not lessened, only with the peach. Farmers are planting fruits for home uses.

FORD COUNTY.—BY JAMES NICOLL, SPEAREVILLE.

Orchards: On March 1st and November 1st, 1886, trees of all classes were in a good condition. The wood growth of 1886 was medium of all classes.

Of the spring planting, about 8 per cent. of all classes failed. In the spring of 1886 there were more trees of all classes planted than in the preceding year.

Insects: The borer attacked the peach, and the plum was stung by the curculio.

Vineyards: Grapes seem to be doing well here. But a few have fruited yet. The average market price paid per pound this season was 8c.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in a good condition.

Russian Apricot: On March 1st, and November 1st, 1886, trees were in good condition; the oldest planted trees in this county are three years.

The acreage of fruit planting is annually increasing in this county. The confidence of our people in horticultural work has not lessened during the past and present years. Farmers are generally planting fruits for home uses.

GREENWOOD COUNTY.—BY A. N. GODFREY, MADISON.

Orchards: On March 1st and November 1st, 1886, trees of all classes were in a good condition. The current year's wood growth was strong of all classes, excepting the cherry, which was medium.

Of the spring planting about 10 per cent. of the apple, cherry, peach and plum, and 25 per cent. of the pear failed, caused by drouth.

Location and Soil: The apple has produced the best results the past years on an upland, rolling prairie, with a clay, sandy soil; cherry on a rich bottom land; peach on an upland, so as to escape the late frosts; the pear does the best on an upland. The poorer soils seem the least liable to produce trees affected by blight.

The following varieties are the most successful in this county in tree and fruit: Apple—Summer, Oldenburg, Early Harvest, American Summer; autumn, Maiden's Blush, Fameuse, Haas, Porter, Haskell's Sweet; winter, Winesap, Stark, Ben Davis, Rawle's Genet, Jonathan, Northern Spy, Willow Twig, White Winter Pearmain, Red Canada. Cherry, Early Richmond; peach, Amsden, Alexander, Stump the World, Crawford's Late, Heath Cling, Steadley; pear, Bartlett, Flemish Beauty, Angouleme; plum, Wild Goose.

Of the apple crop in 1886, 75 per cent. was marketable. Average of the market price per bushel paid for the product: Apple 80c., cherry \$3, pear \$2, plum \$2.50.

Considering all trouble and expense, apple and plum orchards are very profitable; others are not.

The fruit-planting in the spring of 1886 was not as large as usual.

Insects: The codlin moth was prevalent this season; seems to be on the increase. The curculio seem to be increasing.

Vineyards: About 75 per cent. of the crop matured, and of average quality. The following varieties are the most successful in this county: Black, Concord, Champion; white, Niagara, Lady. The Concord is the best variety for family and market use. Location: Vineyards have done the best the past five years on an upland, rather light soil, trained to wire trellis, with clean culture and close pruning each spring. In 1885, fully 50 per cent. of the crop was destroyed by rot.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in a good condition. Small fruits do the best on the richest bottom soil; the better the soil, the better the quality of fruit. The average market price paid per crate of twenty-four boxes each was as follows: Blackberry and strawberry \$2.40, raspberry \$3.60. The following varieties are the most successful in this county: Gooseberry, Houghton, Downing; raspberry, medium, Turner, Thwack, Gregg; strawberry, early, Crescent, Chas. Downing; medium, Capt. Jack; late, Kentucky.

The acreage of fruit-planting in this county is slowly increasing. The general confidence of our people has increased in the work of horticulture, and farmers are generally planting fruits for home use.

HARPER COUNTY.—By LEONIDAS CARSON, ANTHONY.

Orchards: On March 1st and November 1st, 1886, trees of all classes were in a good condition. The wood growth of 1886 was strong of the apple and cherry, medium of the peach, pear and plum.

Since 1884, 10 per cent. of the apple trees have failed. Of the spring planting of 1886, 50 per cent. of the apple, 10 per cent. of the cherry and pear and 7 per cent. of the peach failed, caused by drouth.

Trees of all classes have during the past years done the best on our rolling-prairie lands. No difference as to location has been discovered.

The most successful varieties in this county in tree and fruit are the following: Apple—Summer, Early Harvest, Carolina June, Red Astrachan, Cooper's Early; autumn, Maiden's Blush, Rambo, Lowell, Jonathan; winter, Ben Davis, Missouri Pippin, Winesap, Jonathan, Huntsman Favorite. Cherry, Early Richmond, Montmorency, English Morello; peach, Amsden, Alexander, Crawford's Early, Old Mixon Free, Stump the World, Smock; pear, Osband's Summer, Madeleine, Bartlett, Flemish Beauty, Howell, Tyson, Vicar, Winter Nelis; plum, Wild Goose, Miner, Weaver.

Orchards of all classes are very profitable investments. The planting in the spring of 1886 was in excess of that of the preceding year.

Insects: The flat-headed borer attacked the apple trees this season, peach trees were injured by borers, plum fruit was injured by the curculio.

Vineyards: The grape matured a full crop, which was No. 1 in quality. The most successful varieties in this county are the Concord, Delaware, and Martha. The Concord is the best variety for market and family use. The average market price paid per pound this season was 7c. All locations and soils are productive with the grape. The following varieties are preferred: Early, Moore's, Worden; medium, Concord, Delaware; late, Cynthiana.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in a good condition. Location and soils: Any location that has natural drainage and a red soil which retains moisture will produce the best results. Average market price paid per crate of twenty-four boxes each the current year: Blackberry \$2.40, currant, gooseberry, raspberry and strawberry \$3. The most successful varieties in this county are: Blackberry, early, Kittatinny; late, Lawton; currant, Red Dutch; gooseberry, Houghton, Downing, Smith; raspberry, early, Tyler, Souhegan; late, Gregg; strawberry, early, Crescent, Capt. Jack; medium, Cumberland; late, Windsor Chief, Miner.

Russian Fruits: On March 1st and November 1st, 1886, trees were in a good condition.

The acreage of fruit-planting, and the general confidence of our people in the work of horticulture, are increasing in this county. Farmers are planting fruit quite extensively.

KINGMAN COUNTY.—BY L. W. LEACH, KINGMAN.

Orchards: On March 1st, 1886, trees of all classes were in good condition, excepting the peach, which was considerably damaged by the extreme cold winter of 1885. On November 1st, 1886, trees of all classes were more or less debilitated by the continuous drouth of the past summer. The wood growth of 1886 was light of all classes.

Since 1884, 20 per cent. of the peach failed, caused by borers; of the spring planting, 20 per cent. of the apple, cherry and peach, and 10 per cent. of the plum failed, on account of drouth.

Locations and Soils: For the past years all classes of fruit trees have produced satisfactory results on a black, sandy loam.

The following varieties are the most successful in tree and fruit in this county: Apple—Summer, Early Harvest, Carolina June, Cooper's Early; autumn, Maiden's Blush, Rambo, Lowell; winter, Missouri Pippin, Winesap, Ben Davis, Rome Beauty, Rawle's Genet, Willow Twig, Lawver. Cherry, Early Richmond, English Morello; peach, Amsden, Foster, Alexander, Large Early York, Heath Cling, Salway, Smock; pear, Bartlett; plum, Wild Goose, Lombard.

Only a few apple trees are in fruiting. About 75 per cent. of the crop was marketable. Apple, cherry, peach and plum orchards are very profitable for either family or market use.

In the spring of 1886 there were more apple, cherry, pear and plum trees planted than in the preceding year, but not of the peach.

Insects: The flat-headed borer has done light damage to the apple tree; peach-tree borers have been damaging; the curculio damaged the fruit of the plum to some extent. The curculio, flat-headed apple-tree borer and peach-tree borer are increasing in numbers.

Vineyards: About 75 per cent. of the grape crop of 1886 matured, but was very poor in quality, on account of the drouth. The Concord and Dracut Amber are the most successful varieties in this county; Concord is the best variety for family and market use. The average price paid per pound for grapes this season was 6c. Lo-

cation: For the past five years vineyards have done the best on an elevated dark sandy loam, with good cultivation, and thorough summer and winter pruning.

Small Fruits: On March 1st and November 1st, plantations of all classes were in a good condition, excepting the strawberry, which suffered severely from the drouth. The average market price paid per crate of twenty-four boxes each was: Blackberry and raspberry \$4.80, gooseberry \$2.40, strawberry \$3.60. The most successful varieties in this county are: Blackberry, Kittatinny; gooseberry, Houghton; raspberry, McCormick, Gregg; strawberry, early, Crescent, Chas. Downing, Capt. Jack.

Russian Apricot: On March 1st and November 1st, 1886, trees were in a good condition. The age of the oldest planted trees in this county is four years.

The acreage of fruit-planting in this county is increasing, but the general confidence of our people in the work of horticulture is weakening. Farmers are planting fruits generally for home uses, and some for market.

KIOWA COUNTY.—BY DAVID MORRISON, GREENSBURG.

Orchards: On March 1st and November 1st, 1886, trees of all classes were in good condition. The wood growth of 1886 was light of all classes.

About 15 per cent. of the planting of all classes of trees has failed since 1884. Of the spring-planted apple, about 22 per cent. failed; of the pear, about 15 per cent., caused by drouth.

Apples sold for \$1.50 per bushel in this market this season.

Small Fruits: On November 1st, 1886, plantations of all classes were in a very poor condition.

Farmers are planting fruits for home uses.

LABETTE COUNTY.—BY J. L. WILLIAMS, OSWEGO.

Orchards: On March 1st and November 1st, 1886, trees of all classes were in a good condition. The wood growth of 1886 was strong of the peach; of others, medium.

Since 1884, 25 per cent., of the peach and 15 per cent. of the plum have failed, caused by cold winters. The per cent. of failures in the spring planting was: Of the apple, 25 per cent.; cherry, 15 per cent.; peach, 20 per cent.; pear, 10 per cent.; caused by the drouth. The most successful varieties in this county, in tree and fruit, are as follows: Apple—Summer, Early Harvest, Red Astrachan, Hightop Sweet; autumn, Maiden's Blush, Dominie, Rambo, Jonathan; winter, Ben Davis, Missouri Pippin, Winesap, Rawle's Genet, Willow Twig. Cherry, Early Richmond; pear, Summer Doyenne, Clapp's Favorite, Flemish Beauty, Bartlett, Louise Bonne de Jersey, Angouleme, Vicar, Lawrence; plum, Wild Goose, Miner.

This season 60 per cent. of the apple crop was marketable. The following is the average market price paid per bushel this season: Apple 35c., cherry \$3.20, pear \$2, plum \$2.50.

Considering all expenses, orchards of the apple, peach and plum are profitable.

About the same number of trees were planted in the spring of 1886 as the year before.

Diseases: The apple tree was slightly touched with the twig blight.

Insects: The codlin moth was damaging to the apple more this season than in the preceding year. The curculio injured the plum about the same as last season.

Vineyards: The grape crop this season was about the same as last season in quality and quantity. The following varieties are the most successful in this county: Black, Concord; red, Perkins, Delaware; white, Martha. The Concord is the best market and family variety. The average market price paid per pound this season

was 3c. Location: Vineyards do well on a well-drained gravelly soil, manured and well cultivated. The Hartford and Concord are preferred for general purposes.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in good condition. The following is the average price paid per crate of twenty-four boxes each: Blackberry and currant, \$2.40; gooseberry, \$2; raspberry, \$3.50; strawberry \$1.85. The estimated yield per acre is as follows: Blackberry, 50 crates; gooseberry, 40 crates; raspberry, 35 crates; strawberry, 60 crates. The following list of varieties are the most successful in this county: Blackberry, early, Kittatinny; late, Snyder; gooseberry, Houghton; raspberry, early, Doolittle; medium, McCormick; late, Turner; strawberry, early, Crystal City; medium, Crescent; late, Kentucky.

Russian Fruits: On March 1st and November 1st, 1886, trees were in good condition. These trees are not as hardy as native sorts. On March 1st, 1886, apricot trees were injured by the preceding winter. On November 1st, 1886, trees were in good condition.

The oldest planted orchard trees in this county were set out twenty years ago.

The acreage of fruit-planting in this county is annually increasing. The general confidence of our people in the work of horticulture has not lessened during the past and present years. Farmers are generally planting fruits for home use.

MONTGOMERY COUNTY.—By H. BRITTON, RADICAL CITY.

(*North half.*)

Orchards: On March 1st and November 1st, 1886, trees of all classes were in a good condition. The wood growth of 1886 was strong of the pear and plum, medium of the apple, cherry and peach.

Location and Soil: The apple produces best on an eastern slope, well sheltered on the south, on a rich soil, well drained; the cherry and peach on a high, dry situation with gravel subsoil; pear and plum succeed on a high, dry soil, sheltered on the south.

The most successful varieties in this county are as follows: Apple—Summer, Early Harvest, Carolina June, Summer Queen, Red Astrachan; autumn, Maiden's Blush, Roman Stem, Rome Beauty, Fameuse, Jonathan; winter, Missouri Pippin, Willow Twig, Ben Davis, White Winter Pearmain, Rawle's Genet, Winesap, Huntsman, Milam, Nickajack, Grimes's Golden. Cherry, Early Richmond, English Morello, common Morello; peach, Amsden, Hale's, Stump the World, Old Mixon Free, Old Mixon Cling, Heath Cling; pear, Bartlett; plum, Wild Goose, Chickasaw, Damson.

Of the apple crop of 1886, about 90 per cent. was salable. The average market price paid per bushel this season for fruit was as follows: Apple 50c., cherry \$2.50, pear \$2, plum \$1.50.

Considering all costs, orchards are no doubt the most profitable part of the farm.

Vineyards: The grape crop suffered about 40 per cent. from rot; quality was very poor. The most successful varieties in this county are: Black, Concord; red, Dracont Amber, Delaware; white, Martha. The Concord is the best variety for market or family purposes. Location and soil: For the past five years, vineyards have done well on a good sandy soil, having an eastern slope, given good cultivation, trained on a smooth wire trellis, and given close pruning. The Concord and Dracont Amber are preferred for general purposes.

Small Fruits: On March 1st and November 1st, 1886, plantations were in a good condition. Small fruits will succeed on a rich limestone soil. The following is a list of the average market price paid per crate of twenty-four boxes each: Blackberry \$3, gooseberry \$1.50, raspberry and strawberry \$3.60. Estimated yield of bushels per acre: Blackberry 160, currant 320, gooseberry 500, raspberry 150, straw-

berry 250. The following is a list of the most successful varieties in this county: Blackberry, early, Kittatinny; late, Lawton; currant, Red Dutch, Cherry; gooseberry, Downing, Houghton; raspberry, McCormick; strawberry, early, Wilson, Chas. Downing, Crescent.

The acreage of fruit-planting is annually increasing in this county, and farmers are planting fruits for home uses.

(*South half.—By P. C. Bowen, Cherryvale.*)

Orchards: March 1st and November 1st, 1886, trees of all classes were in good condition. The wood growth of 1886 was strong of the apple and peach, cherry and plum medium, and pear light.

The per cent. of failures since 1884 are as follows: Of the apple, about 10 per cent., caused by neglect, borers and sun-scald; peach, about 40 per cent., caused by borers, poor stock, and the extreme cold winters; pear, about 10 per cent., caused by blight; plum, about 5 per cent., caused by wind and borers. Of the spring planting that failed, the per cent. is as follows: Of the apple 25 per cent., cherry 15 per cent., peach 20 per cent., pear and plum 10 per cent.; all caused by planting inferior stock, which was shipped in by eastern nurseries, and the drouth.

Location and Soil: The apple and peach succeed best on a high rolling land sloping to the north and west, and a sandy loam soil; cherry on gently rolling land, and rich mellow soil; pear, gently rolling land, moderately rich, with little limestone soil mixed in; plum, gently rolling or flat, rich soil, having a clay subsoil.

The most successful varieties in this county in tree and fruit are as follows: Apple—Summer, Early Harvest, Carolina June, American Summer, Bailey's Sweet; autumn, Jonathan, Lowell, Maiden's Blush, Rambo; winter, Ben Davis, Winesap, Missouri Pippin, Willow Twig, Gilpin, Roxbury Russet, White Winter Pearmain, Smith's Cider, Hubbardston, Lawver. Cherry, Early Richmond, May Duke; peach, Alexander, Amsden, Heath Cling, Stump the World, Crawford's Late; pear, Mt. Vernon, Bartlett, Flemish Beauty, Clapp's Favorite, Angouleme, Vicar; plum, Wild Goose.

About 80 per cent. of the apple crop this year was marketable. The average market price paid per bushel this season was: Apple 30c., cherry \$2.66, peach \$2, pear \$3, plum \$2.50.

Considering the cost of land and trees, orchards are very profitable.

The spring planting of 1886 was about the same in extent as that of the preceding year.

The apple and pear were attacked by blight this season.

Insects: The codlin moth and curculio damaged the fruit of the apple, and borers the tree; the leaf-roller attacked the cherry tree, and the curculio its fruit; borers worked on the peach tree, and the curculio the fruit. The codlin moth, round-headed apple-tree borer and peach-tree borer were more numerous in this locality than usual.

Vineyards: The grape matured 75 per cent. of a crop this season. The following varieties are the most successful: Black, Concord, Isabella; red, Catawba, Dracut Amber, Delaware, Iona; white, Martha. The Dracut Amber is the best market variety; the Concord is the best family variety. The average price paid per pound in this market this season was 6½c. Location: Vineyards succeed well on a sandy loam, high elevation, sloping to the south and east, with close winter and summer pruning. Where rot is prevalent, cover the bunches with paper sacks.

Small Fruits: On March 1, 1886, plantations of all classes were in a good condition, excepting the raspberry, which was badly winter-killed. On November 1st, 1886, plantations of all classes were in a good condition. Small fruits will do mod-

erately well on any good, strong, dry soil. The average market price paid per crate of twenty-four boxes each was: Blackberry and gooseberry \$2, raspberry \$4, strawberry \$2 50. The estimated yield of bushels per acre is as follows: Blackberry 25, gooseberry 50, strawberry 37½. The most successful varieties in this county are as follows: Blackberry, early, Early Harvest; medium, Lawton; late, Kittatinny, Snyder; currant, Red Dutch, Cherry; gooseberry, Downing, Houghton; raspberry, early, Tyler; medium, McCormick; late, Gregg; strawberry, early, Crystal City; medium, Chas. Downing, Crescent; late, Kentucky.

Russian Fruits: On March 1st and November 1st, 1886, trees were in a miserably poor condition. The Red Astrachan and Oldenburg fruited successfully this season. On March 1st and November 1st, 1886, apricot trees were in a poor condition.

The acreage of fruit planting is annually increasing in this county. The confidence of our people in the work of horticulture has not lessened during the past and present years. Farmers are generally planting fruits for home uses, and some are planting for the market.

NEOSHO COUNTY.—By JOHN A. CROSS, CHANUTE.

(North half.)

Orchards: On March 1st, 1886, trees of all classes were in a good condition, excepting the apple. On November 1st, 1886, trees of all classes were in a good condition, excepting the apple and pear, which were badly blighted and sun-scalded. The wood growth of 1886 was light of all classes.

The per cent. of failures since 1884 was as follows: Of the apple 25 per cent., caused by sun-scald, exceedingly cold winters, with warm days following occasionally; cherry 15 per cent.; peach and pear 30 per cent., caused by severe winters and blight. Of the spring planting of 1886 the per cent. of failures was as follows: Apple 20 per cent, cherry and pear 25 per cent., peach 15 per cent., plum 10 per cent., caused by drouth.

Location and Soil: Apple and cherry thrive on a northern slope, having a loamy soil and sandstone subsoil; peach and plum, south slope, sandy loam; pear, north slope, clay soil, if possible.

The following varieties are the most successful in this county in tree and fruit: Apple—Summer, Red Astrachan, Early Harvest, Carolina June; autumn, Maiden's Blush, Lowell, Fall Wine; winter, Ben Davis, Missouri Pippin, Winesap, Rome Beauty. Cherry, Early Richmond, English Morello; peach, Amsden, Rivers, Louise, Large Early York, Crawford's Early. Stump the World; pear, Bartlett, Angouleme, Howell, Kieffer, Sheldon; plum, Wild Goose, Golden Beauty.

About 50 per cent. of the apple crop in 1886 was marketable. The average market price paid for fruit per bushel in 1886 was: Apple 30c., cherry \$3, pear and plum \$2.

Considering expenses, apple, cherry, pear and plum orchards are very profitable; the peach is not.

The planting of the spring of 1886 was about the same in extent as that of the preceding spring.

Diseases: The pear was attacked by blight this season.

Insects: The tree and fruit of the apple were damaged by the borers of both classes, and the codlin moth and canker worm; the peach was infested by the borer; the plum crop was damaged by the curculio. The codlin moth, round-headed apple-tree borer, flat-headed apple-tree borer and peach-tree borer were more numerous this year than usual.

Vineyards: The most successful varieties in this county are as follows: Black, Concord and Worden; red, Dracut Amber; white, Martha, Lady. The Concord is the

best variety for both family and market use. The average market price paid per pound for grapes this season was 2c. Location: For the past five years vineyards have produced the best results on a southeastern slope, land heavily trenched, given shallow cultivation, and open pruning. The Concord and Worden are preferred. The rot damaged the crop 50 per cent. this season. Prune out, and induce new wood; a dense growth promotes rot.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in good condition. A southeastern slope, friable loamy soil, heavily manured, produces the best results. The average market price paid per crate this season was as follows: Blackberry and strawberry \$2.40, gooseberry \$1.15, raspberry \$3. The estimated yield of quarts per acre is as follows: Blackberry, raspberry and strawberry, 1,000. The following varieties are the most successful in this county: Blackberry, early, Early Harvest; medium, Kittatinny; gooseberry, Smith; raspberry, Souhegan, McCormick, Turner, Cuthbert; strawberry, early, Crescent; medium, Chas. Downing, Warder; late, Glendale.

Russian Fruits: On March 1st and November 1st, 1886, apple trees were in a good condition. On March 1st, 1886, young apricot trees were in a good condition, old trees were damaged by the past winter. On November 1st, 1886, trees were in a poor condition, caused by the drouth. The oldest trees in this county were planted twenty years ago.

The acreage of fruit-planting is annually increasing in this county. The confidence of our people has lessened to a certain extent in the work of horticulture, but farmers are generally planting fruits for their home uses and market.

(South half.—By C. W. Hayden, Thayer.)

Orchards: On March 1st and November 1st, 1886, trees were in a good condition. The wood growth of 1886 was medium of all classes.

Per cent. of failures since 1884: Of the apple 10 per cent., caused by round-headed borers and sun-scald; peach 75 per cent., caused by severe winters. The per cent. of failures of the spring planting of 1886: Of apple and cherry 25 per cent., pear 15 per cent., caused by drouth.

Location and Soil: During the past year the apple has produced the best results on an upland north or east slope, and soil that will produce a good corn crop, well drained—limestone soil is preferred; the best results with the cherry have been produced on a good, rich, well-drained soil, manured every year after bearing begins. This is true of the peach and pear.

The following is a list of the most successful varieties in this county of tree and fruit: Apple—Summer, Early Harvest, Oldenburg, Cooper's Early; autumn, Maiden's Blush, Fall Wine, Lowell, Autumn Strawberry; winter, Winesap, Missouri Pippin, Jonathan, Dominie, Willow Twig, Rome Beauty, Smith's Cider, Ben Davis. Cherry, Early Richmond, English Morello; peach, Alexander, Amsden, Briggs's May; pear, Bartlett, Osband's Summer; plum, Wild Goose, Miner.

Of the crop of apples in 1886, about 90 per cent. was marketable. The average market price paid for fruit per bushel was as follows: Apple 40c., pear \$2, plum \$1. Orchards of all classes, excepting the peach, are very profitable.

The planting in the spring of 1886 was not as great as that of the preceding spring.

Insects: The round-headed apple-tree borer was the only insect prevalent this season.

Vineyards: The grape matured 50 per cent. of a crop this season. The following varieties are the most successful in this county: Black, Concord, Ives, Cynthiana;

red, Draout Amber; white, Elvira, Martha. The Elvira and Concord are the best market varieties; the Concord is the best family variety. The average market price paid per pound this season was 3¢. Rot injured the crop 25 per cent.

Small Fruits: On March 1st and November 1st, 1886, plantations of all classes were in good condition.

The acreage of fruit-planting in this county is annually increasing, especially of the apple. The confidence of our people in the work of horticulture has not lessened during the past and present years, and farmers are generally planting fruits for home uses.

PRATT COUNTY.—BY FRANK GILLETTE, SARATOGA.

Orchards: On March 1st and November 1st, 1886, trees of all classes were in a good condition, excepting the peach. The wood growth of 1886 was strong of all classes excepting the pear, which was medium.

Of the spring planting of 1886, about 20 per cent. of all classes of trees failed from the effects of drouth and neglect.

Location and Soil: I would recommend for all classes of trees a north slope, as it keeps the trees from blooming early. A good black sandy soil, well drained, plowed deep and well manured, is preferred. Trees should be mulched about the first of June.

The most successful varieties in this county in tree and fruit are: Apple—Summer, Early Harvest, Carolina June, Red Astrachan; autumn, Maiden's Blush, Rambo, Fameuse; winter, Ben Davis, Winesap, Missouri Pippin, Willow Twig. Cherry, Early Richmond, May Duke, Governor Wood; peach, Amsden, Alexander, Large Early York, Arkansaw Traveller, Old Mixon Free, Foster, Stump the World; pear, Early Harvest, Madeleine, Osband's Summer, Bartlett, Flemish Beauty, Clapp's Favorite, Vicar, Lawrence; plum, Wild Goose, Weaver, Damson, Chickasaw.

A carefully-managed orchard is more profitable than any of the farm crops.

The planting in the spring of 1886 was larger than that of the preceding year. The apple tree was slightly attacked by the flat-headed borer.

Vineyards: As a location for a vineyard, I would prefer an eastern slope and a sandy soil, with good and deep cultivation, trained on a wire trellis, and kept properly pruned. The Concord, Delaware and Clinton are preferred.

Small Fruits: On March 1st and November 1st, 1886, plantations were in a good condition, excepting the strawberry, which was partially winter-killed and damaged by the drouth. The following varieties are the most successful in this county: Blackberry, early, Kittatinny, Early Harvest; medium, Snyder; late, McCracken; currant, Red Dutch, White Grape, White Dutch; gooseberry, Houghton, Downing; raspberry, early, Doolittle, Tyler, Turner; medium, McCormick; late, Gregg, Shaffer; strawberry, early, Crescent, Wilson; medium, Charles Downing, Ironclad; late, Kentucky, Windsor Chief.

Russian Fruits: On March 1st and November 1st, 1886, apple trees were in a good condition. On March 1st and November 1st, 1886, apricot trees were in a good condition. The age of the oldest trees in this county is three years.

The acreage of fruit-planting is annually increasing in this county. The general confidence of the people in the work of horticulture is increasing. Nearly all of the farmers are planting trees for home uses.

SEDGWICK COUNTY.—BY A. J. COOK, WICHITA.

Orchards: On March 1st, 1886, trees of all classes were in a good condition, excepting the cherry, which was injured by the severe winter. On November 1st, 1886,

trees of all classes were in a good condition. The wood growth of 1886 was medium of all classes.

Failures since 1884 were very light. The per cent. of failures in the spring planting was as follows: Of the apple, cherry and pear 45 per cent., caused by neglect; peach, about 10 per cent.; plum, about 50 per cent.

Location and Soil: A sandy loam with a porous clay subsoil is the best for the apple and cherry; during the dry seasons the flat bottom lands are the best for the peach and pear; the strongest bottom land seems to be the natural home of the plum.

The following varieties are the most successful in this county in tree and fruit: Apple—Summer, Early Harvest, Cooper's Early, Early Strawberry, Maiden's Blush, Sops of Wine; autumn, Fall Wine, Rambo, Belmont, Maiden's Blush, Fall Pippin; winter, Winesap, Missouri Pippin, White Winter Pearmain, Ben Davis, Rawle's Genet, Gilpin, Yellow Belflower, Fallawater. Cherry, Early Richmond, Elton; peach, Amsden, Alexander, Hale's, Large Early York, Crawford's Early, George IV, Stump the World, Old Mixon Free, Old Mixon Cling; pear, Summer Doyenne, Giffard, Bloodgood, Bartlett, Seckel, Belle Lucrative, Angouleme, Flemish Beauty, White Doyenne, Winter Nelis, Vicar, Lawrence, Glout Morceau; plum, Wild Goose, Sand, Damson, Golden Egg, Weaver.

Not over 50 per cent. of the apple crop was marketable this season. The following is the price paid per bushel: Apple 75c., cherry \$3.50 to \$4, peach \$3, pear \$3.50, plum \$3 to \$4.

In our part of the county orchards are profitable. We have a ready market for all classes at good prices. There has been more fruit planted this season than at any time since this county was settled.

Apple and pear trees blighted lightly this season.

Vineyards: The crop of 1886 was heavy and well matured. The following varieties are the most successful in the county: Black, Concord, Isabella, Clinton; red, Dracut Amber, Delaware; white, Martha, Lady, Goethe, Pocklington. The Concord is the best for market, and the Delaware, Concord and Catawba for family uses. The average market price paid per pound this season was 5c. Location: Vineyards are very productive and profitable when planted on a sandy, loamy bottom land. The following varieties are preferred: Early, Moore's, Hartford, Blood's Black; medium, Concord, Dracut Amber, Delaware, Martha; late, Catawba.

Small Fruits: On March 1st and November 1st, 1886, plantations seemed to be in a good condition. Location and soil: The blackberry succeeds best on a deep, strong, black loamy soil; the currant on clay soil—sandy loam is preferable for all fruits as a rule; the strawberry succeeds well on loamy valley lands. The following is the average market price paid per crate of twenty-four boxes each this season: Blackberry \$2, currant and strawberry \$2.50, gooseberry \$1.50, raspberry \$3. The most successful varieties in this county are: Blackberry, early, Early Harvest, Wilson jr.; medium, Lawton; late, Snyder; currant, Red Dutch, Cherry, White Grape, White Dutch; gooseberry, Houghton, Hudson's Early; raspberry, early, Doolittle, Hopkins, Rancocas, Marlboro; medium, Marlboro; late, Gregg; strawberry, early, Crescent, May King, Ironclad; medium, Crescent, Chas. Downing, Cumberland; late, Parry, Manchester, James Vick, Windsor Chief.

Russian Apricot: On March 1st and November 1st, 1886, trees were in a good condition.

The acreage of fruit-planting is annually increasing in this county, and the confidence of our people in horticultural work is strengthening. Farmers are generally planting fruits more or less for home purposes.

SUMNER COUNTY.—By L. A. SIMMONS, WELLINGTON.

Orchards: All classes of fruit trees were in good condition on March 1st and November 1st, 1886, excepting the peach, which was only fair. The current year's wood growth was medium to strong of the pear; medium of all other classes, excepting the peach, which was light.

Failures since 1884 have been quite light, but the heaviest of apple and peach. Negligence appears to be the main cause. None of the plum, excepting such trees as had been propagated on peach root, failed. Of the spring planting, about 20 per cent. of the apple, 10 per cent. of the cherry and peach, and 5 per cent. of the pear and plum, failed, owing to lack of proper cultivation, and drouth.

Judging from the results in the past, apple trees make the strongest growth, and produce the largest-sized fruit, on bottom lands, but with thorough culture, uplands have yielded a very fine product; peach succeeds on any location; pear, plum and cherry on uplands.

List of varieties most successful in tree and fruit: Apple—Summer, Carolina June, Early Harvest, Cooper's Early; autumn, Maiden's Blush, Rambo, Lowell; winter, Jonathan, Rome Beauty, White Winter Pearmain, Missouri Pippin, Dominie, Smith's Cider, Ben Davis. Cherry, Early Richmond, English Morello and common Morello; peach, Alexander, Louise, Amaden, Stump the World, President, Old Mixon Free, Crawford; late, Heath Cling; pear, Summer Doyenne, Osband's Summer, Bartlett, Angouleme, Flemish Beauty, Louise Bonne of Jersey, Vicar; plum, Wild Goose, Miner, and varieties of the Sand plum.

About 75 per cent. of the apple crop in 1886 was marketable. The average price paid for fruits of the orchard in 1886 per bushel was: Apple 95c., cherry \$3, pear \$4, plum \$3.50.

All classes are profitable for family and market purposes.

Diseases were not prevalent; only a few instances of sun-scald damaged the trees.

Insects were not numerous. A few of the apple-tree borer and canker worm were found on the trees, and the plum curculio and gouger in the fruit of the peach, cherry, and plum. A weevil damaged the apples and cherries slightly.

Vineyards yielded 90 per cent. of a full crop, which was good in quality. The Concord, Worden and Moore's [Early] are the most successful black varieties; Dracut Amber, Catawba, Massasoit for red; Martha and Pocklington for white. Grapes sold in our market the present season at an average of 3c. per pound. Grape-vines succeed on most all classes of soil found in the county. Rot nor mildew has been prevalent.

Small Fruits: Plantations of blackberry and gooseberry were in good condition on March 1st, 1886; others were only fair. On November 1st, 1886, all were in good condition, excepting raspberry and strawberry, which were damaged in growth by the season's drouth. Location and soil giving the best results: Blackberry, on bottom land, lightly sandy; gooseberry, any class will do; raspberry, upland, and quite sandy; strawberry, upland, with a northern or eastern slope, and quite sandy land. Average of the market price paid for the fruit the current year per crate of 24 quarts: Blackberry \$4.20, raspberry \$4.20, gooseberry \$2.65, strawberry \$3.25. The successful varieties are: Blackberry, Kittatinny, Snyder; gooseberry, Houghton; raspberry, early, Davison's and Souhegan; medium, Doolittle, Hopkins; late, Gregg; strawberry, early, Crescent, Chas. Downing; medium, Cumberland, and the above-named varieties; late, Kentucky.

Russian Fruits: None, except the common varieties of apples—Red Astrachan and Oldenburg—have fruited. I cannot discover any greater hardiness in any of

this class than of the common sorts of apples grown in the Western States. A few apricot trees have been planted, and seem hardy in tree.

The acreage of fruit-planting is annually increasing, and our farmers, having full confidence in the success of fruit-growing, are planting generally for home uses.

WILSON COUNTY.—By GEO. B. BROWN, FREDONIA.

Orchards: On March 1st and November 1st, 1886, trees of all classes were in a good condition, excepting the peach, which was poor. The current year's wood growth was medium of all classes.

Since 1884, 25 per cent. of the old peach trees failed, on account of borers and severe winters. Of the spring planting, 5 per cent. of the apple, 10 per cent. of the cherry and 20 per cent. of the peach failed, on account of neglect and drouth.

Orchards of all classes do well on a good, rich, dry soil. Locations are of little importance.

The most successful varieties in this county in tree and fruit are: Apple—Summer, Carolina June, Early Harvest, American Summer, Oldenburg; autumn, Maiden's Blush, Jonathan, Porter, Grimes's Golden; winter, Winesap, Willow Twig, Ben Davis, Rawle's Genet, Gilpin, Stark, Roman Stem, Rome Beauty. Cherry, Early Richmond, English Morello; pear, Seckel, Flemish Beauty, Clapp's Favorite, Lawrence.

About 80 per cent. of the apple crop of 1886 was marketable. The following is the average market price paid per bushel this season: Apple 50c., cherry \$3.20, pear \$3, plum \$2.

Apple, cherry and pear orchards are very profitable; peach and plum are not, because they do not give the plum sufficient attention.

The spring planting of 1886 was not as large as that of the preceding spring.

Insects: The codlin moth was prevalent with the apple, and seems to be on the increase. The curculio attacked the fruit of the plum more this season than ever before.

Vineyards: The grape matured 50 per cent. of a crop this season, but of poor quality. The Concord, Worden and Dracut Amber are the most successful varieties in this county, the Concord being the best for family and market purposes. The average market price paid per pound this season was 4c. Location: For the past five years, vineyards have produced satisfactory results on a southern slope, deep limestone soil, with clean cultivation, until last year, when mulching proved much more beneficial. In some vineyards rot damaged the crop 50 per cent.

Small Fruits: On March 1st, 1886, plantations of all classes were in a good condition, excepting the raspberry, which was slightly injured by the severe winter of 1885. On November 1st, 1886, plantations of all classes were in a good condition. Plantations of all classes seem to do best on rich bottom lands. The average market price paid per pound this season was as follows: Blackberry and strawberry \$2.40, gooseberry \$1.20, raspberry \$3.60. The following varieties are the most successful in this county: Blackberry, early, Early Harvest; late, Kittatinny; gooseberry, Houghton.

Russian Apricot: On March 1st, 1886, old trees were somewhat debilitated; young trees were in a good condition. On November 1st, 1886, trees were in a good condition. The age of the oldest planted trees in this county is fifteen years.

The acreage of fruit-planting in this county, and the general confidence of our people in the work of horticulture, are annually increasing. Farmers are planting fruits for both family and market purposes.

WOODSON COUNTY.—By W. W. SMITH, LEROY.

Orchards: On March 1st, 1886, trees of all classes were in good condition. On November 1st, 1886, trees of all classes had suffered injury from the dry, hot summer. The wood growth of 1886 was medium of all classes.

The per cent. of failures since 1884 is as follows: Of the apple, 50 per cent., caused mainly by neglect; cherry and plum, 10 per cent., caused by neglect and borers; peach about 50 per cent., caused by old age, borers, severe winters, and neglect. Of the spring planting, 10 per cent. of all classes failed for the want of rain.

Location and Soil: Our fertile bottom lands, especially those cleared from timber, seem to produce the best results.

Of all classes of fruit trees, the following varieties are the most successful in this county in tree and fruit: Apple—Summer, Early Harvest, Red Astrachan, Carolina June, American Summer; autumn, Buckingham, Rambo, Fameuse, Maiden's Blush; winter, Winesap, Ben Davis, Missouri Pippin, Smith's Cider, Rawle's Genet, Milam, Willow Twig, Limber Twig. Cherry, Early Richmond, May Duke, common Morello; peach, Amsden, Hale's, Alexander, Old Mixon Free, Crawford's Early, Smock, La Grange; pear, Bartlett, Clapp's Favorite, Sheldon, Flemish Beauty; plum, Wild Goose, Miner.

Of the apple crop in 1886, about 80 per cent. was marketable. Average market price paid per bushel: Apple 85c., cherry and plum \$2, pear \$1.

Orchards of all classes are profitable.

The spring planting of 1886 was not in excess of that of the past spring. Pear trees were injured 5 per cent. by blight this season.

Insects: The apple was infested by the codlin moth more this season than last; the curculio was not so bad on the cherry and plum; crown borers worked on the peach, but not as severely as usual.

Vineyards: About 80 per cent. of the crop of 1886 was marketable, and very fine in quality. The following varieties are the most successful in this county: Black, Concord; red, Dracut Amber, Delaware; white, Martha. The Concord is the best family and market variety. The average market price paid per pound this season was 2½c. For the past five years vineyards have produced the best results on a timber clearing or other rich soil, trained on wire trellises, and given moderate pruning. The following varieties are preferred: Concord, Delaware, Martha, Dracut Amber, Clinton. The crop was injured 20 per cent. this season by rot.

Small Fruits: On March 1st, 1886, plantations were in a good condition, excepting the blackberry, which was slightly winter-killed. On November 1st, 1886, plantations were in a good condition, excepting the strawberry, which was rather poor. The average market price paid per crate of twenty-four boxes each was as follows: Blackberry \$2.40, currants \$3.60, gooseberry \$1.20, raspberry \$3.20. The average yield of bushels per acre was as follows: Blackberry and raspberry 50, strawberry 80. The following varieties are the most successful in this county: Blackberry, early, Kittatinny; late, Snyder; currant, Red Dutch; gooseberry, Houghton; raspberry, early, Tyler, Turner, Hopkins, Doolittle; medium, Miami; late, McCormick, Shaffer, Cuthbert; strawberry, early, Crescent; medium, Cumberland; late, Glendale, Manchester.

The age of the oldest planted orchards in this county is twenty-seven years.

The acreage of fruit-planting is annually increasing in this county, and the confidence of our people in the work of horticulture has not lessened during the past and present years. Farmers are generally planting fruits for home use.

ORCHARDS, SMALL FRUITS, AND VINEYARDS.

SPECIALLY FURNISHED BY HON. WM. SIMS, SECRETARY OF THE STATE BOARD OF AGRICULTURE.)

Table showing, by counties, the number of fruit trees in bearing for the year 1886.

COUNTIES.	Apple.	Pear.	Peach.	Plum.	Cherry.
Allen	74,499	1,439	18,788	2,201	14,176
Anderson	84,755	1,821	17,066	2,638	14,940
Atchison	121,290	1,045	8,543	1,128	11,846
Barber	983	14	11,855	85	854
Barton	4,155	190	8,669	660	1,862
Bourbon	157,678	4,383	30,940	4,212	26,485
Brown	131,396	628	23,085	2,589	16,043
Butler	70,513	1,977	276,845	16,562	32,098
Chase	18,333	473	20,504	1,685	5,033
Chautauqua	60,370	1,782	117,875	9,756	18,237
Cherokee	169,470	3,948	58,184	7,649	33,139
Cheyenne					
Clark	82	2	612		24
Clay	28,218	460	30,534	10,472	12,364
Cloud	21,903	166	17,908	4,243	10,559
Coffey	93,990	4,062	41,670	6,856	17,765
Comanche					
Cowley	72,264	2,801	360,492	11,817	26,904
Crawford	116,576	2,846	29,029	4,514	22,604
Davis	17,683	832	6,887	2,248	7,469
Decatur					7
Dickinson	55,588	1,391	36,213	8,699	22,892
Doniphan	130,707	1,024	8,111	1,775	9,825
Douglas	159,639	6,350	16,043	2,318	22,834
Edwards	442	165	784	848	137
Elk	49,349	865	108,282	4,616	12,952
Ellis	741	10	1,811	655	500
Ellsworth	7,897	267	13,496	811	2,612
Finney*	150		1,100	20	20
Ford	218	10	260	202	116
Franklin	120,682	2,021	14,463	3,361	21,149
Gove					
Graham	10		13	75	44
Greenwood	47,612	1,464	79,829	4,099	20,867
Hamilton	60		25		2
Harper	3,732	112	122,384	3,201	1,669
Harvey	43,382	1,320	208,695	7,835	14,319
Hodgeman	59		1,778	53	63
Jackson	99,128	633	2,859	841	10,579
Jefferson	104,580	1,317	17,706	1,049	23,995
Jewell	20,114	378	24,480	8,666	10,155
Johnson	99,249	2,720	3,645	7,790	19,008
Kingman	2,467	486	36,850	7,199	3,715
Kiowa	12		170		
Labette	226,585	13,519	92,220	11,170	34,894
Lane					
Leavenworth	177,368	2,895	18,994	1,892	17,598
Lincoln	2,742	140	12,166	1,260	1,355
Linn	131,559	6,717	16,984	5,293	18,273
Lyon	108,209	2,835	70,513	3,555	18,346
Marion	26,774	1,249	70,349	4,768	14,060
Marshall	64,416	758	6,078	1,386	12,411
McPherson	39,474	1,221	105,681	5,698	18,511
Meade			20		
Miami	120,083	2,422	8,096	2,827	24,355
Mitchell	18,891	280	88,970	5,765	9,906
Montgomery	130,974	3,251	112,547	9,484	31,168
Morris	37,741	1,041	23,023	2,761	22,501
Nemaha	58,881	474	3,563	727	10,251
Neosho	111,241	2,668	75,015	4,167	24,956
Ness	204	2	2,292	1,800	25
Norton	202	21	334	757	120
Osage	109,557	1,570	28,045	3,626	23,506
Osborne	4,363	73	11,584	2,058	2,457
Ottawa	18,207	370	33,503	3,675	9,805
Pawnee	687	40	2,349	156	570
Phillips	2,167	56	940	258	506
Pottawatomie	59,745	954	6,911	2,408	16,257
Pratt	636	6	10,357	1,931	400

* Report of 1885; no return for 1886.

ORCHARDS, SMALL FRUITS, AND VINEYARDS—CONTINUED.

TABLE showing, by counties, the number of fruit trees in bearing for the year 1886—*Concluded*.

COUNTIES.	Apple.	Pear.	Peach.	Plum.	Cherry.
Rawlins	15	2	4		
Reno	20,610	560	199,140	12,490	10,570
Republic	32,574	582	5,484	4,512	12,707
Rice	12,563	487	69,089	15,062	9,509
Riley*	29,409	478	28,347	1,864	5,832
Rooks	964	12	11,529	3,836	1,001
Rush	609	18	4,603	5,776	416
Russell	1,229	301	3,398	950	1,246
Saline	26,916	1,612	37,891	6,441	11,172
Scott					
Sedgwick	73,063	3,588	223,558	9,199	23,071
Seward					
Shawnee	121,641	4,583	29,111	2,789	25,363
Sheridan					
Sherman					
Smith	7,498	66	6,871	1,977	2,999
Stafford	1,023	108	28,236	4,047	1,830
Stevens					
Sumner	54,101	1,304	514,523	10,161	26,666
Thomas					
Trego	52	1	638	200	46
Wabunsee	46,226	1,288	10,411	1,858	6,725
Washington	37,596	452	12,421	2,440	13,277
Wilson	96,697	1,775	72,037	6,826	20,994
Woodson	43,645	1,069	30,453	1,992	14,316
Wyandotte	97,609	1,019	22,233	3,172	8,686
Unorganized					
Total	4,343,582	111,062	3,888,218	324,961	971,579

TABLE showing, by counties, the number of fruit trees not in bearing for the year 1886.

COUNTIES.	Apple.	Pear.	Peach.	Plum.	Cherry.
Allen	91,019	2,294	28,297	3,361	9,932
Anderson	59,505	1,543	18,310	2,635	7,779
Atchison	58,245	1,195	6,761	1,365	3,346
Barber	50,863	1,272	54,824	2,265	3,678
Barton	29,638	1,133	46,964	3,476	9,324
Bourbon	97,875	3,940	24,410	6,562	10,205
Brown	93,880	1,567	37,856	2,980	6,512
Butler	180,507	5,728	123,500	12,631	24,459
Chase	38,661	2,970	16,990	2,545	5,444
Chautauqua	90,124	3,591	56,196	8,440	10,984
Cherokee	92,388	5,432	29,107	6,827	11,715
Cheyenne					
Clark	33,507	987	40,635	3,658	2,952
Clay	99,026	2,494	45,401	8,249	16,124
Cloud	89,597	1,679	49,701	5,599	22,690
Coffey	110,711	3,364	32,922	5,313	11,783
Comanche	12,630	534	27,689	1,143	1,444
Cowley	150,701	7,358	144,528	14,755	21,737
Crawford	110,566	10,059	25,785	5,746	13,274
Davis	38,722	1,789	35,048	2,537	6,862
Decatur	16,643	180	15,283	1,421	1,546
Dickinson	131,485	5,384	84,773	9,702	20,401
Doniphan	65,575	652	8,631	812	1,535
Douglas	70,475	3,202	9,624	2,063	4,770
Edwards	14,073	1,669	12,209	2,307	2,090
Elk	83,285	3,708	55,057	5,678	10,090
Ellis	3,852	325	2,483	1,315	1,676
Ellsworth	27,251	1,202	30,384	3,277	7,551
Finney*	3,080	42	5,101	219	248
Ford	10,404	346	14,543	2,307	1,030
Franklin	61,934	2,175	11,108	3,048	7,230
Gove	25				5
Graham	3,062	701	10,325	837	566
Greenwood	95,408	5,663	78,037	5,942	12,371
Hamilton	1,431		1,841	14	40

* Report of 1885; no return for 1886.

ORCHARDS, SMALL FRUITS, AND VINEYARDS—CONTINUED.

TABLE showing, by counties, the number of fruit trees not in bearing, for the year 1886—*Concluded*.

COUNTIES.	Apple.	Pear.	Peach.	Plum.	Cherry.
Harper.....	77,202	3,381	180,098	8,187	8,611
Harvey.....	61,687	4,984	48,677	11,355	13,160
Hodgeman.....	6,683	99	8,370	1,093	652
Jackson.....	72,048	1,546	12,698	1,419	4,027
Jefferson.....	64,784	2,393	13,753	1,698	7,015
Jewell.....	129,557	2,897	59,481	5,784	27,707
Johnson.....	22,962	1,467	7,067	1,160	4,537
Kingman.....	64,380	2,579	153,282	15,282	12,955
Kiowa.....	11,630	340	25,580	840	1,240
Labette.....	130,431	13,113	48,034	9,901	13,410
Lane.....	200	.....	225	12	12
Leavenworth.....	64,788	1,678	17,240	1,101	3,417
Lincoln.....	29,419	889	39,423	3,812	6,869
Linn.....	32,635	1,995	8,636	2,119	4,637
Lyon.....	100,674	2,934	37,917	4,048	10,274
Marion.....	121,667	11,632	69,719	11,185	18,047
Marshall.....	153,152	2,743	28,127	3,749	12,177
McPherson.....	94,569	4,580	97,453	8,832	21,839
Meade.....	14,757	564	26,028	1,895	1,507
Miami.....	32,193	1,802	7,078	1,713	4,446
Mitchell.....	69,846	1,379	36,723	7,847	14,900
Montgomery.....	104,974	7,127	45,151	11,528	14,534
Morris.....	86,122	3,205	38,224	4,666	9,805
Nemaha.....	111,637	1,982	31,154	2,658	7,976
Neosho.....	32,614	4,514	33,242	4,640	11,945
Ness.....	5,634	191	20,388	5,641	1,015
Norton.....	14,600	184	21,702	3,564	2,462
Osage.....	121,496	2,584	33,165	3,787	12,603
Osborne.....	48,365	1,093	52,717	3,869	13,142
Ottawa.....	62,311	2,407	59,339	5,821	17,410
Pawnee.....	9,678	793	13,472	1,874	3,316
Phillips.....	29,863	1,561	15,623	2,193	4,739
Pottawatomie.....	101,508	3,335	19,369	2,630	10,284
Frat.....	29,536	972	67,069	6,340	4,428
Rawlins.....	8,068	520	4,590	997	561
Reno.....	86,920	4,090	228,570	14,090	20,470
Republic.....	121,934	3,061	82,335	8,852	28,476
Rice.....	67,580	2,870	94,653	18,024	21,855
Riley.....	70,063	1,141	39,063	1,407	7,985
Rooks.....	28,442	3,788	58,523	9,129	6,199
Rush.....	6,412	109	35,637	3,761	3,244
Russell.....	15,402	410	16,907	1,852	5,570
Saline.....	66,904	4,519	49,715	6,458	11,082
Scott.....	.....	.....	.....	.....	.....
Sedgwick.....	126,058	7,190	116,423	9,606	17,300
Seward.....	.....	.....	.....	.....	.....
Shawnee.....	108,995	3,071	21,709	3,510	12,479
Sheridan.....	690	233	1,340	188	196
Sherman.....	130	13	106	203	240
Smith.....	72,129	1,050	45,608	4,758	13,917
Stafford.....	36,327	1,082	85,948	6,323	6,166
Stevens.....	.....	.....	.....	.....	.....
Sumner.....	206,818	8,527	263,107	14,208	31,536
Thomas.....	160	.....	406	97	75
Trego.....	2,024	32	4,041	376	253
Wabanssee.....	88,326	2,284	28,198	2,154	8,067
Washington.....	148,318	6,810	89,275	7,157	18,097
Wilson.....	62,025	2,525	23,518	4,819	9,917
Woodson.....	49,597	1,541	20,484	2,915	7,393
Wyandotte.....	43,951	562	12,957	1,988	1,676
Unorganized.....	.....	.....	.....	.....	.....
Total.....	5,695,673	232,599	3,838,678	423,474	809,235

* Report of 1885; no return for 1886.

ORCHARDS, SMALL FRUITS, AND VINEYARDS—CONTINUED.

TABLE showing, by counties, the number of acres in small fruits and vineyards for the year 1886.

COUNTIES.	Rasp- berries.	Black- berries.	Straw- berries.	Vine- yards.
Allen.....	38	53	23	188
Anderson.....	31	28	15	56
Atchison.....	52	31	47	148
Barber.....	4	5	4	12
Barton.....	1	2		4
Bourbon.....	53	54	47	77
Brown.....	35	31	16	93
Butler.....	58	116	39	230
Chase.....	34	17	7	161
Chautauqua.....	38	83	24	39
Cherokee.....	61	140	121	71
Cheyenne.....				
Clark.....	890	1,552	643	885
Clay.....	429	282	401	67
Cloud.....	47	53	53	40
Coffey.....	28	76	14	70
Comanche.....	109	348	587	
Cowley.....	66	321	56	123
Crawford.....	63	87	50	89
Davis.....	6	12	15	50
Deatur.....	1	1	1	6
Dickinson.....	29	45	23	84
Doniphan.....	84	29	12	335
Douglas.....	116	75	103	189
Edwards.....	21	18	7	
Elk.....	37	79	17	79
Ellis.....	38		325	8
Ellsworth.....	49	22	11	22
Finney *.....	8		1	4
Ford.....	1		2	19
Franklin.....	35	57	25	49
Gove.....				
Graham.....	76	24	1	
Greenwood.....	54	67	8	35
Hamilton.....				
Harper.....	103	111	119	
Harvey.....	144	54	34	106
Hodgeman.....	7	6	2	1
Jackson.....	18	23	11	46
Jefferson.....	43	14	4	38
Jewell.....	38	22	19	27
Johnson.....	84	119	19	167
Kingman.....	35	141	123	26
Kiowa.....	50	143	150	
Labette.....	32	136	110	104
Lane.....				
Leavenworth.....	55	20	56	178
Lincoln.....	12	1	1	12
Linn.....	18	165	10	10
Lyon.....	16	41	9	76
Marion.....	300	43	38	112
Marshall.....	42	78	24	40
McPherson.....	59	143	43	173
Meade.....	117	129	3	221
Miami.....	32	42	11	83
Mitchell.....	14	11	10	10
Montgomery.....	100	174	40	145
Morris.....	121	11	16	104
Nemaha.....	211	204	90	391
Neosho.....	31	60	18	87
Ness.....	1	1	1	
Norton.....	2	2	1	2
Osage.....	46	84	26	75
Osborne.....	123	6	6	4
Ottawa.....	151	54	21	30
Pawnee.....	16	4	3	3
Phillips.....	1	1	1	
Pottawatomie.....	31	21	13	83
Pratt.....	29	10	7	9
Rawlins.....	8	4	2	1
Reno.....	13	62	18	61
Republic.....	24	29	12	35
Rice.....	20	14	14	630
Riley *.....	8	20	13	88
Rooks.....	2	1	1	2
Rush.....	74	411	52	10

* Report of 1885; no return for 1886.

ORCHARDS, SMALL FRUITS, AND VINEYARDS—CONCLUDED.

TABLE showing, by counties, the number of acres in small fruits and vineyards for 1886—*Concluded.*

COUNTIES.	Rasp- berries.	Black- berries.	Straw- berries.	Vine- yards.
Russell.....	1	1	2	.....
Saline.....	24	31	22	61
Scott.....	.....	.....	.....	.....
Sedgwick.....	45	97	16	107
Seward.....	.....	.....	.....	.....
Shawnee.....	160	96	59	128
Sheridan.....	.....	.....	.....	.....
Sherman.....	.....	.....	.....	.....
Smith.....	84	7	4	2
Stafford.....	16	4	1	5
Stevens.....	.....	.....	.....	.....
Sumner.....	47	120	80	85
Thomas.....	.....	.....	.....	.....
Trego.....	16	.....	.....	.....
Wabaunsee.....	11	12	8	92
Washington.....	49	37	39	84
Wilson.....	26	71	12	94
Woodson.....	2	16	114	12
Wyandotte.....	332	84	221	192
Unorganized.....	.....	.....	.....	.....
Total.....	5,636	6,904	4,882	7,530

VOTED FRUIT LIST FOR KANSAS, 1886.

NORTHERN FRUIT DISTRICT.

FAMILY ORCHARD.—Varieties receiving the highest vote, arranged in the order of preference.		SUMMER APPLES.															
		Archibald	Brown	Clay	Cloud	Davis	Dickinson	Dorphan	Jackson	Jefferson	Jewell	Leavenworth	Lincoln	Marshall	Mitchell	Nemaha	Ottawa
1	Early Harvest	1	1	2	2	1	1	1	1	1	4	1	1	1	1	1	1
2	Carolina June	2	2	1	1	2	2	1	5	2	3	3	3	3	3	2	2
3	Red Astrachan	3	3	5	5	4	2	2	2	3	4	4	2	2	2	3	3
4	Cooper's Early [White]	2	3	3	3	4	3	4	4	5	3	3	3	3	3	3	3
5	Oldenburg	4	4	4	5	5	6	6	3	5	5	2	2	2	2	2	2
Scattering votes:																	
6	Hightop Sweet	5	5	5	5	5	5	5	6	6	7	5	3	4	4	6	5
7	American Summer				6			5			6	4	4			5	6
8	Early Pennock				4		5				1	6	4			7	6
9	Summer Queen										1						
10	Keswick Codlin										8	6				2	
11	Benoni										9					4	
12	Early Joe				3			4								9	
13	Primate								6	7		10					
14	Sops of Wine																
15	Alexander									4	2						
16	Autumn Bough																
17	Early [Red] Margaret											11				2	
18	Golden Sweet																
19	Fourth of July															4	
20	Summer Rose							3									
21	Tetofsky											7					

AUTUMN APPLES.

1	Maiden's Blush	1	1	1	1	1	1	1	1	2	1	3	1	1	2	1	1	1
2	Rambo	5	3			2	4	5	2	4	2	1	3	2	1	3	2	3
3	Lowell				4	2		3	3	3	3	5	2	4	3	3	3	6
4	Jonathan	6	2							4		3	2	4	3	6	4	5
5	Fameuse					5	3	3	5	4		4	4	4	5			3
Scattering:																		
6	Chenango				3			2	5		1				4	2	3	
7	Fall Wine				2			5	2						7	5	6	4
8	Grimes's Golden				4							4		5		3	2	4
9	Rome Beauty			2												7		
10	Autumn Strawberry						6				5	5						
11	Porter										6							
12	Wine										6		2	5				
13	Bailey's Sweet															8		
14	Mother																	2
15	Fulton								6									7
16	Benoni								2									
17	Golden Pippin	2									7	6		5				
18	Hawley																	
19	Keswick Codlin						2											
20	Westfield Seek-no-further	3																
21	Soulard						7											
22	Celestia			1								7						
23	Fallawater	4																
24	Fall Orange				3													
25	Fall Winesap					4								6				
26	Orange Pippin											8						
27	Gabriel														7			
28	Bellemont						4											
29	Jeffers											9						
30	Gramar's Pearmain															10		
31	Hubbardston												8					
32	Ortley								6								4	
33	Domine											10						
34	Buckingham						8											
35	Colvert						9											
36	Twenty-Ounce												7					

NORTHERN FRUIT DISTRICT—CONTINUED.

MARKET ORCHARD.—Varieties receiving the largest vote, arranged in the order of preference.		AUTUMN APPLES.															
		Wyandotte	Washington	Shawnee	Saline	Russell	Riley	Republic	Phillips	Ottawa	Nemaha	Michell	Marshall	Lincoln	Lawson	Jewell	Jefferson
1	Maiden's Blush	1	1	1	1	1	1	1	1	2	1	1	3	1	1	1	1
2	Rambo	2	2	4	2	4	2	4	2	1	5	2	3	4	3	4	3
3	Lowell	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4	Fameuse	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
5	Jonathan	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Scattering:																	
6	Chenango	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
7	Grimes's Golden	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
8	Fulton	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
9	Fall Wine	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
10	Pound Sweet	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
11	Fall Orange	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
12	Porter	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
13	Wine	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
14	Orange Pippin	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
15	Oldenburg	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
16	Bailey's Sweet	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
17	Mother	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
18	Keswick Codlin	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
19	Autumn Strawberry	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
20	Buckingham	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
21	Dominie	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
22	Golden Pippin	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
23	Red Astrachan	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
24	Fall Winesap	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
25	Wagener	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
26	Smokehouse	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
27	Soulard	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
28	Fallwater	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
29	Westfield Seek-no-further	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
30	Northern Spy	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
31	Ortley	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
32	Rome Beauty	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
33	Cooper's Early [White]	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33
34	Talman's Sweet	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
35	Gramar's Pearmain	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
36	Esopus Spitzenberg	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
37	Fall Pippin	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37
38	Twenty-ounce Apple	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38

WINTER APPLES.

1	Ben Davis	1	1	5	1	3	3	1	1	1	2	1	2	2	3	1	3	1	3	1	2	2	1	1	1
2	Winesap	2	2	1	6	1	6	2	2	2	3	1	3	3	1	3	4	2	6	1	3	4	3	3	4
3	Missouri Pippin	3	3	2	7	5	7	3	5	3	1	3	4	3	2	4	1	3	4	3	3	3	1	2	2
4	Rawle's Genet	4	4	4	5	7	4	4	9	4	6	4	1	4	4	2	5	4	10	3	4	2	6	6	6
5	Jonathan	5	5	3	3	2	5	5	3	5	4	5	5	5	5	5	5	1	7	4	5	7	4	3	3
6	Willow Twig	6	6	6	8	4	8	6	7	5	7	6	7	6	7	6	7	6	5	7	6	7	6	7	6
7	Smith's Cider	7	7	7	10	8	7	10	8	7	10	8	7	10	8	7	10	8	7	10	8	7	10	8	7
8	Rome Beauty	8	8	8	9	9	9	9	9	9	10	8	9	9	9	9	9	9	12	8	9	9	8	8	8
9	Gilpin	9	9	6	6	6	6	6	6	6	8	9	8	9	8	9	8	9	8	9	8	9	8	9	8
10	Dominie	10	10	10	10	10	10	10	10	10	8	7	10	8	7	10	8	7	10	8	7	10	8	7	10
Scattering:																									
11	White Winter Pearmain	11	11	7	7	7	7	7	7	7	8	11	6	6	6	6	6	6	5	10	9	10	9	10	9
12	Talman's Sweet	12	12	10	10	10	10	10	10	10	11	12	7	7	7	7	7	7	7	7	7	7	7	7	7
13	Wagener	13	13	9	9	9	9	9	9	9	11	13	8	8	8	8	8	8	8	8	8	8	8	8	8
14	Grimes's Golden	14	14	14	14	14	14	14	14	14	10	14	8	8	8	8	8	8	2	14	6	14	6	14	6
15	Lawver	15	15	15	15	15	15	15	15	15	2	15	13	13	13	13	13	13	13	13	13	13	13	13	13
16	Yellow Bellflower	16	16	16	16	16	16	16	16	16	4	16	5	5	5	5	5	5	5	5	5	5	5	5	5
17	Minkler	17	17	17	17	17	17	17	17	17	8	17	13	13	13	13	13	13	13	13	13	13	13	13	13
18	Milam	18	18	18	18	18	18	18	18	18	13	18	10	10	10	10	10	10	10	10	10	10	10	10	10
19	York Imperial	19	19	19	19	19	19	19	19	19	9	19	10	10	10	10	10	10	11	11	11	11	11	11	11
20	Ortley	20	20	20	20	20	20	20	20	20	2	20	10	10	10	10	10	10	11	11	11	11	11	11	11
21	Pewaukee	21	21	21	21	21	21	21	21	21	14	21	10	10	10	10	10	10	10	10	10	10	10	10	10
22	Phoenix	22	22	22	22	22	22	22	22	22	14	22	10	10	10	10	10	10	10	10	10	10	10	10	10
23	Wealthy	23	23	23	23	23	23	23	23	23	14	23	10	10	10	10	10	10	10	10	10	10	10	10	10
24	Fameuse	24	24	24	24	24	24	24	24	24	15	24	10	10	10	10	10	10	10	10	10	10	10	10	10
25	Lansingburg	25	25	25	25	25	25	25	25	25	15	25	10	10	10	10	10	10	10	10	10	10	10	10	10
26	Major	26	26	26	26	26	26	26	26	26	15	26	10	10	10	10	10	10	10	10	10	10	10	10	10
27	Baldwin	27	27	27	27	27	27	27	27	27	15	27	10	10	10	10	10	10	10	10	10	10	10	10	10
28	White Pippin	28	28	28	28	28	28	28	28	28	15	28	10	10	10	10	10	10	10	10	10	10	10	10	10

[illegible]

BLACKCAPS.															
<i>Early.</i>															
1	Doolittle.....	...	1	2	1	1	1	1	3	...	1	2	1	1	2
2	Souhegan.....	...	1	...	1	2	1	3	1	...	1	3	2	...	3
3	Hopkins.....	2	2	2	...	4	1
4	Tyler.....	2
5	Davidson's Thornless.....	2	1	3
6	Hixon's Everbearer.....	2
7	Southern Thornless.....	3
<i>Medium.</i>															
1	Miami.....	1	1	1	...
2	Seneca.....	1
3	Canada Black.....	2
4	Hixon's Everbearer.....	1
<i>Late.</i>															
1	Gregg.....	...	1	1	2	...	1	2	2	...	1	1	2	2	1
2	McCormick.....	1	1	2	1	2	1	...	2	1	1	...	1
3	Hixon's Everbearer.....
RED VARIETIES.															
<i>Early.</i>															
1	Turner.....	...	1	1	1	1	1	1	1	1	1	1	1	1	1
2	Hansell.....	2
3	Marlboro.....	...	1	3
4	Philadelphia.....	2	4
<i>Medium and late.</i>															
1	Cuthbert.....	...	1	...	1	...	2	1	1	2
2	Thwack.....	1	1	1
3	Reliance.....	1	3
4	Shaffer's Colossal.....	1	...	1	...
5	Brandywine.....	...	2	3	2	2

[illegible]